CITY OF VANCOUVER

POLICY REPORT

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TO: Vancouver City Council

FROM: General Manager, Planning, Urban Design and Sustainability

SUBJECT: Updates to General Policy for Higher Buildings

RECOMMENDATION

THAT Council approve revisions to the *General Policy for Higher Buildings* generally as described in Appendix A.

REPORT SUMMARY

This report recommends revisions to the Higher Buildings Policy (Appendix A) to align with and support the implementation of the Zero Emissions Building Plan (ZEB Plan).

The 2016 ZEB Plan is the City's strategy to ensure that all new buildings use only 100% renewable energy by 2030. The ZEB Plan is one of North America's first and most comprehensive strategies to significantly reduce greenhouse gas emissions from buildings. The Plan establishes a series of time stepped reductions in greenhouse gas (GHG) emissions for new buildings between now and 2030. Early adoption of innovative building designs and technologies is required to increase industry's capacity to build attractive near zero emission buildings, lower the costs, and enable the adoption of these progressively more stringent requirements over time.

The Higher Buildings Policy requires that the limited number of landmark buildings that are allowed to exceed general height limits demonstrate both exceptional architecture and leadership in sustainable building design. Updating the Higher Building Policy to align with the ZEB Plan will provide clarity and consistency for the building industry regarding the City's expectations for green building leadership from these developments. This would focus innovation on improved building envelopes and low carbon heating technologies. When combined with the scale of these higher buildings, these updates support the market transformation in design, construction practices, and supply chains that are required to achieve the goals of the Zero Emissions Building Plan.

The recommended revisions to the Policy (renamed the from the General Policy for Higher Buildings to the Higher Buildings Policy) also include administrative updates that are reflective of current design review processes and are intended to support best practice in policy implementation.

COUNCIL AUTHORITY/PREVIOUS DECISIONS

1990: Council endorses the "Clouds of Change" report, which calls for actions to reduce carbon pollution in Vancouver.

1997: Following the Downtown Vancouver Skyline Study, Council endorses the General Policy for Higher Buildings, which establishes that buildings which exceed height limits of the time should deliver the highest possible architectural excellence.

2005: Council endorses the Community Climate Change Action Plan, with targets and strategies for greenhouse gas reductions. Council also endorses the development and implementation of the Vancouver Green Building Strategy, a city-wide strategy to reduce the environmental impacts that buildings have on the local environment and global climate change.

2006: Council unanimously initiates the EcoDensity program to plan and develop high quality and strategically located density to make Vancouver more environmentally sustainable, liveable, and affordable.

2011: Council adopts the Greenest City 2020 Action Plan, including the goal to "lead the world in green building design and construction" and the Greenest City 2020 target that "all new construction be carbon neutral in operations". Council also endorses changes to the General Policy for Higher Buildings to require leadership in sustainable design and reduced energy consumption.

2016: Council approves the Zero Emission Building Plan, which establishes four action strategies that aim to ensure new buildings in Vancouver will have no operational greenhouse gas emissions by 2030. Council also endorses updates to the Green Buildings Policy for rezonings to significantly reduce greenhouse gas emissions and energy use through improved building envelopes and the use of low carbon energy systems.

2017: Council endorses the Low Carbon Energy System policy, to ensure that advanced technologies being used to meet greenhouse gas limits in buildings are appropriately commissions, maintained, and optimized as established in the Zero Emissions Building Plan.

CITY MANAGER'S COMMENTS

Vancouver's landmark buildings must continue to drive excellence and innovation by integrating the near zero emission design approaches with exceptional architecture. The proposed updates to the policy align with the goals of the Zero Emissions Building Plan, will provide clarity to industry, and will help to catalyse the transformation of the building industry and thereby

reduce costs of future regulations. The City Manager supports the recommendations in this report.

REPORT

Background/Context

Four higher buildings have been approved since energy efficiency and green building leadership requirements were added to the Higher Buildings Policy in 2011, two of which are currently under construction. Each of these buildings incorporates a wide diversity of unrelated innovations in order to demonstrate leadership in sustainability. The sustainability elements of these buildings range from the ongoing use of renewable natural gas, to on-site waste reduction programming; from the installation of triple-paned windows to the installation of additional electric vehicle charging.

While each of these buildings demonstrates aspects of sustainability leadership for their time, the lack of clarity regarding the City's expectations and priorities will result in:

- A series of unique but isolated design innovations, with limited broad application of lessons learned to future projects;
- Leadership in sustainability being negotiated on a case-by-case basis, rather than being assessed for its potential to have an impact on prioritized city-wide outcomes;
- The failure to leverage building scale innovation into broad market transformation, thereby missing the opportunity to have these exceptional buildings support substantive improved future building performance on a city-wide basis.

A Focused and Performance-based Approach to Green Buildings

The *Zero Emissions Building (ZEB) Plan* (2016) lays out Vancouver's strategy to transition the majority of new buildings to use 100% renewable energy and have no operational greenhouse gases by 2030. The ZEB Plan provides clear and measurable targets and standards for sustainable building design based on greenhouse gas emission and heat loss limits, and a systematic implementation of more stringent limits over time until near-zero energy goals are achieved.

The 2017 *BC Energy Step Code* (Step Code) was based on the ZEB Plan, and was developed with guidance and participation from the City of Vancouver's Green Buildings staff. The Step Code has a goal that all buildings in BC be net-zero energy ready by 2032, and also establishes heat loss limits in five progressive 'steps', with each incremental step representing a higher level of green building achievement. The Vancouver Building By-Law takes a similar approach, but also sets greenhouse gas limitations for buildings.

To align with the ZEB Plan and the BC Step code, updating the Higher Building Policy to also focus requirements on reducing heat loss in buildings and lowering greenhouse gas emissions must occur. The broad parameters of the current policy requirements reduce the replicability of sustainability outcomes in future high-rise buildings. Aligning the Higher Building Policy with the ZEB plan and BC Step Code ensures there is a consistent and harmonized approach to achieving the City's 100% renewable energy goals in the building sector.

Low Carbon Energy Systems:
In addition to significant reduction in the need for heating of buildings through greatly improved building envelopes and heat recovery ventilation, the successful adoption of advanced heating technologies will be required, especially to produce hot water, in order to achieve zero emissions in new construction.

A Low Carbon Energy System (LCES) is a building or neighbourhood scale system that provides heating (and sometimes cooling) to buildings using primarily renewable energy sources. Performance of these complex systems is ensured through requirements that they are professionally commissioned, maintained and optimized.

Strategic Analysis
The objectives for the recommended updates to the Higher Buildings Policy include:

a) Performance-based leadership in sustainable design: Clearly define performance expectations that demonstrate leadership in sustainable design and energy efficiency, while allowing for consistent and comparable greenhouse gas reductions.

b) Replicability of sustainable solutions: The outcomes achieved by higher buildings establish a pathway that future development can follow as the building industry matures and energy efficient building science is more broadly implemented.

c) Leveraging economies of scale: The large floor area of a higher building allows for sustainable design solutions to be developed and implemented while leveraging economies of scale. Buildings of this scale can impact the supply chain and make it attractive to develop or advance new high performance building capacity available in the local market.

To achieve these outcomes, the sustainability requirements in the Policy were shifted from a broad ‘pilot and demonstration’ approach to a performance based approach that supports the successful implementation of the strategic ZEB Plan as well as the provincial BC Energy Step Code.

A secondary benefit of this policy, in conjunction with Vancouver’s other green building policies, is the further development of Vancouver’s development, design, supply chain and construction industry as green building leaders. So far over 7,500 jobs in the Vancouver are directly related to green buildings. Cities across North America are adopting green building policies and Vancouver’s industry stands to win new green jobs and economic advantages by being leaders in this field.

Consultation
In developing the new energy and sustainability requirements for the Policy, staff consulted with developers, architects, building science and mechanical engineers, and LCES providers. The consultation process was structured to understand how high to establish the “green building leadership” bar so that it could successfully support market transformation and adoption of required new technologies and best practices while remaining achievable and consistent with the other Policy objective for exceptional architecture.

Feedback received during consultation that the recommended changes seek to address included:

- *Design Flexibility*: developers and some designers expressed the importance of maintaining flexibility for architectural expression and the ability to maintain relatively high amounts of windows and balconies for liveability and market appeal.

- *Collaborative Approach*: Implementing advanced sustainable building practices will result in unanticipated challenges throughout the design and building process. Stakeholders urged the City to adopt a collaborative and shared learning approach to performance throughout the zoning, development and building review processes.

- *Options*: Stakeholders urged the City to provide options in how they met the GHG and heat loss limits of the Policy including the provision of an alternative that did not rely upon third party certification processes.

- *Professional Operations and Maintenance for Complex Mechanical Systems:* Developers wanted to ensure that low GHG emission limits that result in the buildings incorporating complex technologies would not cause operational and maintenance challenges for stratas.

As a result of industry consultation, staff undertook further research to understand and mitigate the concerns that were raised. The findings of this research inform the proposed new sustainability requirements and are generally supported by industry.

Two Pathways to Demonstrate Focused Green Building Leadership

The updated sustainability requirements recommended for the Higher Buildings Policy move from a subjective "leadership" approach to an objective, performance based approach. The proposed changes establish specific heat loss limits and either GHG limits or primary energy limits for these landmark developments. The new requirements go beyond those required by the Green Building Policy for Rezonings so as to support market transformation and reduce the costs of high performance building envelopes and advanced heating systems for future buildings. In order to satisfy stakeholder interests while still supporting the implementation of the Zero Emissions Building Plan, two policy pathways are recommended.

Option A - Passive House Certification

Designing and building to Passive House Certification requirements leverages the global best practice standard for high performance building envelopes and heat recovery ventilation while also ensuring a shift to renewable energy. The Standard is supported by extensive climate relevant building science research and testing, a wide variety of training programs, and third party validation to ensure successful implementation.

Option A establishes a world leading low carbon building performance benchmark and will drive substantial market transformation if delivered at the scale of these buildings. While it is an exceptionally high standard of performance, a number of private sector developers have already voluntarily opted to pursue it for high rise development approvals.

Option B – Zero Emission Building Plan Limits and LCES Requirements

This option establishes maximum GHG emission and space heating demand limits that are aligned with the ZEB Plan but require higher levels of performance than those included in the Green Building Policy for Rezonings. The specific limits by building type are included as attached in Appendix A. While these requirements are not quite as demanding as those set

by the Passive House Standard, they will still result in significant advancement in low-carbon building design and construction while allowing more flexibility for architectural expression by making it somewhat easier to increase building articulation and incorporate more windows and balconies into the design.

This option also requires that buildings connect to a professionally managed LCES. The LCES connection ensures that to reliably achieve the greenhouse gas outcomes, energy systems are professionally installed and maintained for optimal performance.

In providing two options to achieve leadership outcomes, the proposed policy updates provide clarity to applicants, staff, and City-appointed boards regarding Council expectations for these buildings, yet allow flexibility in how each building achieves its near zero emissions building outcomes.

Collaborative Approach

A key finding from the consultation was the importance of early integration of low carbon and high performance building envelope requirements into the design process. Staff, developers, and consultants all agreed that the best outcomes in sustainable design occur when design teams and staff share a unified understanding of the green building goals and outcomes at the beginning of the project. Even with this integration, real leadership means that these buildings will be proposing and undertaking design and construction approaches that are not yet common in Vancouver and unpredictable challenges are expected to emerge.

The intent of this Policy is to foster leadership. To this end managers from the Green Buildings, Urban Design, Real Estate and Facilities Management, and the Chief Building Official's Office are committed to joint periodic meetings with the development team throughout the process. The intent of these meetings will be to identify and collaboratively resolve potential challenges, provide flexibility, inform shared learning, and maintaining high performance outcomes. In addition, senior staff from the Green Buildings Team will be assigned to act as a liaison for each Higher Building proponent team with other City departments.

Effective Date

During the consultation process, the building industry noted that some projects may be well advanced through the enquiry processes and nearing submission of a detailed rezoning or development permit application. Staff recommend that the updated Policy come into effect for complete applications accepted as of November 1, 2018 thereby providing industry with their requested three months to complete near final applications. In addition, the Director of Planning may exercise discretion in these requirements depending on the circumstance of an application.

Higher Building projects that have completed the City's formal enquiry review process, and submitted a complete rezoning application that is accepted prior to November 1st will still have to comply with the 2014 sustainability requirements, including *demonstrating leadership in sustainable design*. These projects will be assessed against the 2016 ZEB Plan, and are expected to demonstrate performance beyond what other approved higher building projects have achieved to date.

Administrative Updates:
While updating the sustainability and energy requirements of the Higher Buildings policy, staff also identified some minor changes to the overall policy that will support clarity in policy interpretation, application review processes and reflect current city priorities. For example, the requirement for Higher Buildings to provide public observation decks in residential buildings has been removed and a greater emphasis will be placed on contribution to the downtown network of public green space and plazas.

Implications/Related Issues/Risk (if applicable)

Financial

There are no financial implications.

Human Resources/Labour Relations

There are no HR implications.

Environmental

The proposed policy updates are a significant step to reducing greenhouse gas emissions in higher buildings, in alignment with the City's GCAP and Renewable City Strategy targets for reducing greenhouse gas emissions related to buildings.

Legal

There are no legal implications.

CONCLUSION

Updating the Higher Buildings Policy to align with the Zero Emissions Building Plan brings consistency and focus to the sustainability outcomes for higher buildings. By defining leadership in sustainable design to mean exceptional energy efficiency and well defined greenhouse gas reductions, higher buildings will continue to deliver exceptional buildings with collectively beneficial sustainability outcomes under a policy that provides greater clarity for developers. Establishing performance based leadership-in-sustainability criteria will result in measurable high performance building performance standards, replicable building science advances, and consistent zero-emissions buildings market transformation.

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HIGHER BUILDINGS POLICY

Adopted by City Council on May 6, 1997
Amended February 1, 2011, November 20, 2013, June 25, 2014, and February 13, 2018

Application and Intent

These guidelines are to be used in conjunction with all applicable plans and policies for buildings seeking approval through rezoning or development permit, for significant additional height above current zoning and policy, or for those entering into the Queen Elizabeth Park or other Council approved view corridors. The intent of these guidelines is to mark the prominence of the Central Business District in our downtown skyline, while also providing opportunities for strategically placed height at the prominent "gateways" to mark the entry into downtown: the Burrard bridge, the Granville bridge, and the Georgia Gateway in Northeast False Creek.

Requirements

The following should be considered when reviewing proposals for Higher Buildings (i.e. those which significantly exceed current height limits and/or enter into the Queen Elizabeth Park View Corridor):

Design

- Higher Buildings must establish a significant and recognizable new benchmark for architectural creativity and excellence, while making a significant contribution to the beauty and visual power of the city's skyline;
- Higher Buildings are only permitted within the areas identified below in Figure 1;
- The highest buildings (i.e. ~ 550-700') are located within the Central Business District. Of these buildings, the tallest buildings (i.e. ~ 700') should be located on one of Vancouver's three primary streets: West Georgia, Burrard and Granville;
- Secondary heights may be considered for buildings at the Granville and Burrard Bridgeheads with a single prominent tower (~ 500') in axial alignment with the Burrard Bridge, two towers framing the Granville Bridge Gateway (~ 425') **and three towers framing the Georgia Gateway (~400' – 425')**;
- All other applications for additional height at the two bridgehead locations should be analyzed to ensure that the experiential intent of these gateways is maintained;
- The development should not involve the demolition of a Class 'A' heritage building;
- The buildings should achieve community benefits (i.e. as a recipient site for density transfers; retention of important heritage components; provision of significant cultural or social facilities; or provision of low cost housing);
- In addition, Higher Buildings should be considered with careful effort to provide a lasting and meaningful public legacy to Vancouver and should include careful consideration of the following:
    - The building should include activities and uses of community significance and/or public amenity;
    - The development should provide on-site open space that represents a significant contribution to the downtown network of green and plaza space;
    - The building should not contribute to adverse microclimate effects;
    - Careful consideration should be given to minimize adverse shadowing and view impacts on public realm including key streets, parks and plazas, as well as neighbouring buildings;
    - Signage on the buildings should not be located at a height which exceeds the building's current height limit.

Sustainable Design and Energy Efficiency

Higher buildings should demonstrate leadership and advances in sustainable design and energy efficiency which must be accomplished in one of the following ways:

a) Achieve Passive House Certification; or

b) Achieve the following energy performance targets based on building type AND connect to a Low Carbon Energy System (LCES) in accordance with the requirements of the LCES Policy:

	Total Energy Use Intensity (TEUI) (kWh/m^2)	Thermal Energy Demand Intensity (TEDI) (kWh/m^2)	Greenhouse Gas Intensity (GHGI) ($kgCO_2/m^2$)
Residential	100	15	3
Hotel	120	15	4
Retail	100	15	1.5
Office	100	15	1.5

In achieving the performance targets, projects will be encouraged to reduce their use of domestic hot water, leveraging approaches like suite sub-metering, and their impacts on local energy infrastructure, including innovative approaches to managing peak loads.

Note: To ensure higher buildings achieve innovation in greenhouse gas reductions and energy efficiency, higher buildings will not be permitted to aggregate greenhouse gas reductions achieved by another LCES in order to meet the requirements of this policy.

The requirements of the *Green Buildings Policy for Rezonings* apply to all developments subject to the Higher Building Policy.

Process

- All higher buildings will undergo an enhanced review by the Urban Design Panel, which will be supplemented with the addition of two local architects as appointed by the Director of Planning.
- As determined by the Director of Planning, a further enhanced review for buildings with a proposed height of 550’ or more as well as for the Granville Bridge gateway buildings (~ 425’), Georgia Gateway (two tall towers on the waterside of Pacific only) and the landmark building in axial alignment with the Burrard Bridge (~ 500 ‘) will include two additional international design experts joining the Urban Design Panel in addition to the two local architects noted above. A special public engagement, such as a public forum, or guest lecture featuring the panel members and experts may also be held to expand public discussion and education around architectural excellence and green design in Vancouver.

Figure 1. Areas and sites where Higher Buildings are permitted