

2017 Next Edition Building Code Consultation
Ministry of Municipal Affairs and Housing
Municipal Services Division
Building and Development Branch
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Toronto Ontario
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EBR REGISTRY NUMBER 013-0536 — BUILDING CODE CONSULTATION

The Clean Economy Alliance is a group of over 100 organizations representing a broad cross-section of Ontarians that have united to support the province of Ontario in showing leadership in addressing the crucial issue of climate change. The Alliance includes prominent Ontario businesses, industry associations, clean tech companies, labour unions, farmers' groups, health advocates, and environmental organizations. The views expressed in this submission draw on the collective expertise and experience of Alliance members, and were developed in a participatory process over the past three months. ***Our comments are intended to support the Province in making full use of Ontario's Building Code to enable and accelerate Ontario's transition to a low-carbon economy.***

The Ontario Building Code (OBC) is a critical tool in supporting the transition to a cleaner economy. Homes and buildings account for about a quarter of Ontario's GHG emissions. With Ontario's population projected to grow by over 30% over the next 25 years¹, ongoing incremental improvements in energy efficiency are likely to be offset by growth. ***Ontario needs transformative changes in the way we build and renovate buildings, and we need it now before the current building boom locks in carbon emissions*** that will be prohibitively expensive and difficult to address down the line. The Ontario building sector is also a key economic driver for jobs at all skill levels, an engine for innovation in clean technology, and market generator for the local knowledge economy. ***The OBC is a key tool for unleashing the enormous potential of the buildings industry to drive innovation and decarbonization in the built environment.***

The Clean Economy Alliance (CEA) commends the Province for its commitments to achieving net zero new construction by 2030. The CEA also supports many of the building code changes proposed through this consultation. However, we believe that more can and should be done to put Ontario on a pathway to net zero, and that decisive action in the short-term will enable a smoother transition. The purpose of this document is to comprehensively summarize the collective response of our member organizations to the proposals and questions released through this consultation process. Generally, CEA supports the proposed actions to align the OBC with the Province's Climate Change Action Plan. Specifically the CEA supports the proposed actions in the following areas, with some modifications discussed below and in the attached appendix:

- Empowering Local Governments
- Envelope First Approach
- Commissioning Requirements

¹ Ontario Ministry of Finance, *Ontario Population Projections Update, Spring 2017*.

- Energy Use Sub-metering
- Existing buildings
- EV Charging
- Green/Solar/Cool Roofs

A summary of our commentary is provided below and the specific feedback forms are attached for reference to this document.

Additionally we have prepared comments on several topics not raised in the consultation process that the CEA believes are critical to supporting climate action in Ontario and transitioning to a cleaner economy. Specifically the following:

- Establishing a pathway to Net Zero
- Energy Modelling

Topics not addressed in this process

Establishing a trajectory to “Net Zero” in the code

The province of Ontario has articulated a commitment to achieve net zero *carbon* for small buildings by 2030 in the Climate Change Action Plan. Ontario has also committed to achieve net-zero *energy* ready for all buildings by 2030, through the Pan-Canadian Framework on Clean Growth and Climate Change. The CEA supports these ambitious goals. The alliance believes that an achievement of this magnitude will require a complete market transformation. Further, the alliance also believes that in order to achieve this transformation there needs to be a strategic approach that includes the following from a regulatory perspective: a clear articulation of what Net Zero and Net Zero Ready means; a clear set of regulatory steps that the Province will take between now and 2030; a transition towards performance targets (e.g. Energy Use Intensity and/or Greenhouse Gas Intensity) ; and last but not least, the empowerment of local leadership in regulation to push towards this goal in a consistent but timely fashion that is responsive to the local economy.

Industry would benefit from a clear regulatory definition of what Net Zero and Net Zero Ready means for the Province of Ontario. This would include defining the difference between ‘net zero carbon’ and ‘net-zero energy ready’, if both concepts are to be used in the OBC. The articulation of where the Province intends to go would be helpful as the details can have a significant impact on technology choice. The Alliance encourages the Province to review definitions that are already established in Canada such as the CaGBC’s Zero Emissions Buildings Standard, the Canadian Home Builders’ definitions, the City of Toronto’s Zero Emissions Building Framework, and the soon to be released Federation of Canadian Municipalities research paper.

With a clear target, a progressive set of predictable steps to achieve net-zero can be developed to ensure that industry can invest in the appropriate technology and skills to meet the demands of future building regulations. We recognize that the Province is aware of these benefits as evidenced by the provision of the next update to the OBC being provided well in advance of its 2022 enactment. With more aggressive performance targets more notice will help to lower costs.

In addition to providing a clear set of targets the CEA would note that the current practice of updating the building code every 5 years would only provide one further code interval (i.e. 2027) beyond what is already defined for 2022 before the target date for Net Zero is reached. ***The Province should seriously consider moving to a 4 year code cycle, which would allow for an additional incremental step between 2022 and 2030.*** This change would make for smaller steps in performance improvements which may be easier for industry to adjust to.

Transitioning to net-zero will require rethinking the way we regulate energy efficiency and carbon emissions under the OBC. The current approaches of prescriptive rules and code reference buildings are not well suited to the net zero transition, and require a fundamental rethink. Recent research on a large sample of new buildings in Toronto revealed that using a reference building approach did not predictably reduce energy use in part 3 buildings. The reference building methodology resulted in modeled Energy Use Intensity (EUI) that varied by more than 230% for multi-residential buildings, and 450% for commercial buildings, with no correlation between modelled % above code and modelled EUI². While some differences are to be expected this dynamic spread of energy use is enormous. For this reason the City of Toronto's [Zero Emissions Building Framework](#) is proposing a shift to the use of performance targets for energy use, GHG emissions and heating energy demand. This methodology will ensure that buildings are absolutely using less energy and emitting less carbon. It should also be noted that other jurisdictions in Canada such as the City of Vancouver and the Province of BC have adopted similar approaches for the same reasons. Voluntary standards such as [Passive House](#) and the Canada Green Building Council's [Zero Carbon Building Standard](#) also use intensity targets to ensure lower energy and GHG outcomes.

The CEA recommends that the OBC should transition to the use of absolute performance targets for the most common building types. This could begin as an optional compliance pathway, with other compliance pathways phased out in a future code cycle. **Consideration should be given to setting performance targets for total Energy Use Intensity, GHG emissions intensity, and thermal energy demand intensity.** In contrast to prescriptive and reference building approaches, absolute performance targets have the following benefits:

- Improved consistency in energy and environmental outcomes
- Enhanced simplicity and clarity for designers and developers
- Greater flexibility and potential for innovation
- Reduced potential for “gaming” the system

Transitioning to a performance target approach also enables the creation of a road map to the 2030 net zero (ready) goals. The 2030 goals, once defined, provide the required performance targets for the 2030 OBC. The Province can then work back from the 2030 performance targets to develop performance targets for 2026 and 2022. This is precisely the approach taken by the Province of BC with the creation of the [BC Energy Step Code](#). The Energy Step Code lays out a trajectory to net zero ready buildings. This ‘step code’ approach will allow industry and government to invest in the training, technology, and building design/construction processes required to achieve net-zero cost-affordably. A similar approach in Ontario would increase predictability, lower costs and accelerate market transformation. Recognizing that the development of a step code for Ontario would be a longer term project, **the CEA recommends that the Ministry create a working group including all relevant stakeholders to initiate the development of an Ontario energy step code which would be introduced as part of the 2022 OBC update.**

Improved Energy Modelling

Energy modeling is essential to designing low-carbon energy efficient buildings, and it is also increasingly central to complying with OBC energy requirements. As we continue on the path to net-zero, energy modeling will only become more important for optimizing building design and achieving code compliance. However, there is currently very little guidance on how energy models should be done, and what qualifications energy modellers should have. **The CEA recommends that the province take action to improve guidance and standardization on energy modeling for code compliance.**

The CEA believes that significant performance improvements could be achieved in building design through provincial efforts to raise professional practice standards for energy modelling and make them commensurate with other

² City of Toronto – Energy Efficiency Office. *Energy Analysis of Toronto Green Standard Projects, 2011-12*. August 2013.

engineering and architectural processes that impact building code compliance. ***This could include the development of professional practice guidelines that could be developed in cooperation with both the architecture and engineering professional associations.*** Similar draft guidelines have been developed in British Columbia. In addition, the BC Energy Step Code and the City of Vancouver have developed energy modelling guidelines that provide additional process guidance, designed to ensure that energy models are more consistent in their approach. While the focus of these specific guidelines are to address issues related to EUI calculations they also provide guidance on how to address common issues that lead to lower overall energy performance such as how to calculate thermal bridging with greater specificity.

[APEG Professional Practice Guidelines](https://www.eqbc.ca/getmedia/57d1ac24-368d-4800-a671-726c64d82a3f/APEGBC-Building_Enclosure_Guidelines.pdf.aspx)

https://www.eqbc.ca/getmedia/57d1ac24-368d-4800-a671-726c64d82a3f/APEGBC-Building_Enclosure_Guidelines.pdf.aspx

[City of Vancouver Energy Modelling Guidelines](http://vancouver.ca/files/cov/energy-modelling-guidelines-v1.0.pdf)

<http://vancouver.ca/files/cov/energy-modelling-guidelines-v1.0.pdf>

Comments on Topics addressed in Consultation Process

The following is a summary of comments on topics raised in the consultation process. For more detailed comments see the proposal comment forms and survey answers attached to this document.

Empowering Local Governments

The CEA commends the Province's commitments and actions to enable municipalities to implement green development standards based on optional technical standards in the OBC. However, we are disappointed to see that the current proposal is limited to green roofs. While the CEA supports enabling cities to implement green roof standards, we believe that municipalities should be empowered to implement green standards directly addressing energy efficiency and GHG emissions. We note that the Province is increasingly requiring and/or encouraging municipalities to establish GHG reduction targets, develop GHG reduction plans/policies, and report publically on progress³. ***The CEA recommends that municipalities should be empowered to implement green development standards directly addressing energy efficiency and GHG emissions.***

If the Province were to develop an Ontario energy step code, as recommended above, this would provide an ideal framework for municipal green standards. This would allow for a more nuanced approach to market transformation that takes into account the local market conditions of each municipality. This is the approach that has been taken in British Columbia, where the BC Energy Step Code expressly allows municipalities to reference the “step” or “steps” of their choice as city-wide requirements, neighbourhood requirements, or optional requirements with incentives. The reality is that different regions in Ontario vary widely in-terms of their capacity to implement stronger energy efficiency and GHG emissions requirements for new construction. The current “one-size fits all” approach requires slowing progress in the OBC to the speed at which all regions can adapt. ***Allowing municipalities that have greater capacity the option of moving faster towards net zero — while using a consistent framework referenced in the OBC — will benefit all regions of Ontario.*** Cities that move ahead of the minimum OBC requirements will stimulate the industry capacity and experience needed to implement future province wide requirements more cost-effectively.

The CEA recognizes that the development of an Ontario energy step code would take some time. ***As an immediate step, the CEA recommends that the OBC allow Local governments to adopt the 2022 versions of SB-10-B and SB-12-B in advance of province-wide enactment.*** SB-10-B and SB-12-B will have been thoroughly vetted through the current consultation process. Cities that choose to implement them ahead of province-wide enactment will provide real market-testing of the requirements and inform better province-wide deployment in 2022.

³ For example, through the *Growth Plan for the Greater Golden Horseshoe* (2017)

We have provided specific comments on this in Proposals: 2-CC-A-01-04-01

Encouraging An Envelope First Approach - The CEA supports the overall approach taken by the Province in encouraging an envelope first approach to energy conservation. Specifically, the removal of trade-off pathways that allow designers to lower envelope performance, the inclusion of airtightness testing, addressing thermal breaks, and higher thermal resistances are supported by our members. Envelope-based solutions are typically the most durable energy conservation measures and result in the most local economic spin-off. Other benefits include comfort and health for residents, as well as building durability/resilience during power outages. Our comments to the specific proposals offer some nuances that we feel could improve performance even further. **Specifically we support being more aggressive on implementing air leakage testing, and considering even higher resistance values.** From a feasibility and financial standpoint, it is much more beneficial to implement a higher efficiency building envelope at the time of construction than later in the process. In regards to implementing air leakage testing, a phased plan allows industry time to successfully adapt to the process. This plan would first suggest voluntary testing before introducing mandatory testing, and then mandatory testing with a target.

We have provided specific comments on this in Proposals: 2-CC-A-03-02-01, 2-CC-B-12-02-02, 2-CC-B-12-02-03, 2-CC-B-12-02-04

Commissioning Requirements – The CEA supports the inclusion of commissioning in future versions of the OBC. Commissioning has demonstrated to be an effective energy conservation measure that not only is cost effective but also lowers GHG emissions. This is a key component that is often overlooked and directly impacts the performance of new systems. The Alliance sees the inclusion of Commissioning not only being important in new construction but by establishing it as requirement within the OBC allows for the possibility to apply this energy conservation measure to existing buildings. Retro-commissioning commercial and multi-family buildings could have huge potential for energy conservation and GHG emissions reductions.

We have provided specific comments on this in Proposals: 2-CC-B-11-03-01, Commissioning of Large Buildings: Q1-Q5 Responses

With regards to the survey questions, the CEA has provided detailed feedback on how a commissioning requirement could be structured, which is modelled on the Seattle Building Code. Our primary proposal on this topic is that the approach to regulating commissioning based on the size and complexity of the mechanical and electrical equipment rather than the floor area and occupancy triggers that the OBC uses for other fire and life safety requirements and is implied by the survey questions.

We have provided specific comments on this in Proposals: Commissioning of Large Buildings: Q1, Q4 & Q5 Response

Adding Sub-metering – The CEA supports the proposal to add sub-metering to the OBC. The comments we have provided in this area are aligned with the recently developed proposals for energy sub-metering for the next iteration of the Toronto Green Standard. The overall approach to sub-metering should be an economical one with the primary objectives of assign costs to the appropriate users of energy or water, and enabling retro-commissioning and optimisation through-out a buildings useful life.

We have provided specific comments on this in Proposals: Sub-Metering: Q1 – Q3 Response

Existing buildings – *The inclusion of specific upgrade requirements for energy efficiency in existing buildings are strongly supported by the CEA*, given the great impact these can have. The existing building sector in Ontario is one of the largest opportunities to reduce energy use and GHG emissions. The proposals to add requirements will ensure that as our building stock is being renewed opportunities for increased energy efficiency are being realized. Without this effort in the existing building stock, the GHG emissions reduction target for 2030 will be hard, if not impossible, to reach.

We have provided specific comments on this in Proposals: 2-CC-B-11-03-01, Commissioning of Large Buildings: Q1 – Q5.

Electric Vehicle (EV) Charging

Electric vehicles are noted several times in the Climate Action Plan as a tool to reduce GHG emissions in the transportation sector. With more Canadians living in multi-family buildings there is an increasing need to ensure that these buildings are designed to accommodate the growth of these vehicles. For these reasons ***the CEA supports the proposals regarding electric vehicles but recommends that requirements for electric vehicle charging in 20% of spaces be expanded to multi-family buildings by 2019. The CEA supports the ongoing evolution of this requirement over time, and recommends consideration of increasing the number of stalls to 33% in 2022.*** The increase to 33% is an important benchmark as studies have shown that this is tipping point by where there is sufficient infrastructure to service the entire building by utilizing load management technology.

Noting that much of the cost to provide greater and greater number of charging stations in buildings is tied to increasing the electrical service of these buildings the CEA encourages the Province to examine our load management technology can be recognized within the building code to allow for better electrical designs that require less total capacity.

We have provided specific comments on this in Proposals: 2-CC-B-03-01-01

Green/Solar/Cool Roofs

The CEA recognizes that optimizing the roofs of our building stock can be a useful strategy to manage storm water, improve efficiency, cool the urban environment or generate renewable energy. In general the CEA supports all of the proposals but encourages the Province to align the cool roof standards with those already existing in the City of Toronto and cited by the LEED rating systems. Using a lower standard may create market confusion and the industry is delivering these roofs regularly through-out Ontario. Additionally exploring the move from a solar ready to minimum requirement for solar generation on roof tops would be a significant driver of renewable energy development and help build capacity required to achieve net-zero buildings in the future.

We have provided specific comments on this in Proposals: 2-CC-B-04-01-01, 2-CC-B-07-06-01, 2-CC-B-05-10-01, 2-CC-B-12-05-01

Conclusion

The Clean Economy Alliance is sincerely thankful and pleased to have this opportunity to be part of the process in developing the Ontario Building Code. The development and implementation of the OBC comes at a key period of transition for Ontario toward a greener economy, one that will drive innovation in clean technology and growth in the building market. Notwithstanding the economic benefits, the OBC updating comes at a time when substantial climate action is necessary, and the CEA are glad to support this process.

In addition to this provision of comments and suggestions, the CEA would like to extend a general offer of support in any future endeavours to develop further green building standards for the Province of Ontario, including the possibility of an Ontario Building Step Code.

Once again, the CEA thanks the Province of Ontario, and looks forward to the next opportunity for cooperative collaboration.

Clean Economy Alliance Members

ArcTern Ventures	Forests Ontario	Registered Nurses' Association of Ontario
Asthma Society of Canada	Geosource Energy Inc	Responsible Investment Association
BioFuelNet	Green Communities Canada	reThink Green: Solutions for a Sustainable Sudbury
Bioindustrial Innovation Canada	Green Neighbours 21	Shareholder Association for Research & Education
Blue Green Canada	Green Planet Biofuels	Smarter Shift
Bullfrog Power	Holcim Canada Inc.	St Marys Cement
Canadian Association of Physicians for the Environment	Innovolve Group	Sustainability CoLab
Canadian Biogas Association	International Institute for Sustainable Development	Sustainable.TO Architecture + Building
Canadian Solar Industries Association	Lafarge Canada Inc.	The Atmospheric Fund
Canadian Wind Energy Association	LED Roadway Lighting	The Pembina Institute
Carbonzero	Lumos Energy	Terragon Environmental Technologies Inc.
Cement Association of Canada	MaRS CleanTech	Top Drawer Creative
Chrysalix Energy Venture Capital	Mindscape Innovations	Toronto Centre for Active Transportation
Citizens Environment Alliance of Southwestern Ontario	Mountain Equipment Co-op	Toronto Cycling Think and Do Tank
Clean Air Partnership	NAIMA Canada	Toronto Environmental Alliance
Clean Energy Canada	Nanoleaf	Toronto Parks and Trees Foundation
Climate Reality Project Canada	NEI Investments	TREC Renewable Energy Cooperative
CoPower	NRStor Inc	TREC Education
Corporate Knights	Ontario Association of Architects	Unifor
Cycle Toronto	Ontario Clean Air Alliance	United Steelworkers
The Clean 50	Ontario Federation of Agriculture	Windmill Development Group, Ltd.
David Suzuki Foundation	Ontario Lung Association	World Wildlife Fund Canada
Delta Management	Ontario Nature	Zerofootprint Software Inc.
Earth Day Canada	Ontario Rivers Alliance	
Earth Rangers	Ontario Secondary School Teachers' Federation	
Ecosystem Energy Services Inc.	Ontario Society of Professional Engineers	
Efficiency Capital Corporation	Ontario Sustainability Services	
Energy Storage Ontario	Ontario Sustainable Energy Association	
EnviroCentre	Ontario Waterpower Association	
Environmental Defence	OpenConcept Consulting Inc.	
Evergreen CityWorks	Patagonia	
Fadco Consulting Inc.	Perkins+Will	
Faith & the Common Good: Greening Sacred Spaces	Petrolup	
Field Chemical Technologies Inc.	Plug n' Drive	
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