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Institut royal d'architecture du Canada

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House of Commons Standing Committee on Environment and Sustainable Development

Topic: Study of built environment and the building code in Canada

Presentation by the Royal Architectural Institute of Canada (RAIC)

The mandate of the Royal Architectural Institute of Canada (RAIC) is to advocate for excellence in the built environment in Canada, demonstrate how design enhances the quality of life and address important issues of society through responsible architecture.

The RAIC has been addressing environmental challenges for decades; through education, advocacy and promotion of the 2030 Challenge. Our early sustainable buildings committee was the incubator for the Canada Green Building Council.

Currently, the championing of a low-carbon built environment is being carried out by our Committee on Regenerative Environments. Two other committees also have a strong sustainability focus: The RAIC Indigenous Task Force, which is concerned with living conditions in Indigenous and Northern communities, and the Age-Friendly Housing Task Force, which sees retrofits as an important aspect of aging in place. Our scope is national, and we are also part of an international network of architectural associations that share information on sustainability.

Architects, as trained complex problem solvers, can help. Design is the act of creating holistic solutions, and architects are already designing high-performance buildings; leading multidisciplinary teams to deliver innovative projects.

At the scale of individual buildings, architects are delivering building designs which greatly exceed current building codes through measures such as the following:

- passive design strategies;
- energy efficiency measures;
- design for increased durability and resilience;
- innovations that find ways to use less space;
- integration of renewable energy sources;
- specification of low-impact building materials;
- promoting stair use and cycling;
- integration of electric vehicle charging;
- design to help shift people's behaviour to more sustainable patterns.



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These strategies serve to not only reduce emissions but also to increase human health and productivity.

It's not solely a question of building codes. Successful projects require a holistic and integrated approach to the design and construction process, and collaborative delivery models. We urge the adoption of approaches to project delivery characterized by early and regular involvement of owners, architects, consultants, constructors, fabricators and end user/operators in an environment of effective collaboration, mutually defined goals and open information sharing. Among other benefits, an integrated project delivery process can increase creativity and innovation which we believe is the key to meeting aggressive sustainability targets.

Emissions from residential, commercial and institutional buildings account for almost 30 percent of energy use in Canada and almost 25 percent of Canada's greenhouse gas emissions. In Canada's urban centres, buildings are reported to be responsible for about half of all emissions. An increase in code requirements to drastically reduce or eliminate these emissions will require more sophisticated and innovative designs, materials and building systems, builders and building operators.

Today, there exist many barriers to this level of innovation. How projects are defined, how consultants are selected, and the relationships with clients all radically shape the potential outcome.

The federal government is showing leadership but needs to do more. As Canada's single largest owner of buildings and a major lessee, it has a central role in setting the highest standards of excellence and environmental sustainability.

Within the 26 federal departments and agencies that are custodians of buildings, there is an inconsistent commitment and application of sustainable goals. The procurement of services has a significant impact on the successful achievement of project objectives and innovation.

While federal procurement varies, it often leads to a lowest-fee approach which stifles innovation. Federal procurement documents often call for innovation but then limit the design team by stating innovation using proven technologies. True innovation requires going beyond existing technologies.

Additionally, placing intermediaries, such as buildings management service providers, to manage procurement and delivery can create barriers to realizing the full benefit that architects bring to a project.

Innovation means taking the lead and being out front in the application of new principles. The transfer of uninsurable risks to professionals limits professionals in being innovative which then will limit the ability to reduce carbon.



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The RAIC sees the federal government as having several roles

One is the production of the National Building Code. This is a complex activity involving much collaboration with many stakeholders and understandably takes time. This committee's question is what should be done during this time.

The second role is leadership in requirements for building stock. If the code update takes time, there is no need to wait. Federal custodian departments and agencies are in a position now to demand advanced requirements for design and construction of new buildings or retrofits, of leases, and of maintenance operations. This leadership role could greatly assist in convincing other large custodian organizations to follow.

The third role is in leadership in procurement and project management. Procurement should acknowledge that the costs of a building include construction, operations and maintenance and the cost of occupancy such as salaries. On this basis, the relative size of fees dramatically reduces. A building which operates efficiently at low cost and provides a healthy work environment with associated higher productivity must be an objective. To meet these advanced requirements, a procurement process must demand innovation. The same principle applies to housing. Advanced standards not only lead to GHG reductions but healthier living environments reducing health costs and improving the quality of life.

The procurement process should recognize quality, skill, and innovation. An example is Qualifications-Based-Selection, known as QBS, which has support in Canada from organizations including the Federation of Canadian Municipalities and virtually every national professional services association. Public Services and Procurement Canada has issued a Request for Information concerning QBS. RAIC strongly encourages PSPC to follow through on this effort to a pilot project.

LEED, Living Building Challenge standards, and benchmarking frameworks are effective in improving the performance of new and existing buildings. They are, however, voluntary in most jurisdictions and therefore are used in a small percentage of buildings.

The overhaul and mandatory implementation of the National Building Code and the National Energy Code ultimately needs to be the objective.

RAIC's goal is to work with the federal government to foster innovation and generate the cultural shift to a low-carbon economy, and a holistic understanding of sustainability goals.

Key Recommendations

- Move to QBS process with pilot program;
- Re-evaluate 3rd party procurement services;



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- Share risk equitably among team members;
- Adopt collaborative project delivery principles where owners, builders, and designers share common goals and project risks;
- Show leadership by setting high sustainable standards through revised National Energy Code, benchmarking and higher harmonized standards for federal buildings;
- Until a revised code is in place, develop and implement high standards for new buildings and renovation and retrofit of existing buildings for all federal custodian departments and agencies.

Answers to Questions

The committee has asked four questions. Here are the RAIC's answers.

Q1. How could GHG emissions reduction in the building sector be accelerated prior to the next scheduled update to the national model building code?

There are a number of answers to this question.

- a) The federal government must show leadership by adopting advanced standards for its new buildings and all major renovations or refits to existing building stock. These standards can take into account geographic realities, age and heritage value and other factors but improvements to the existing building stock can provide significant benefit.
- b) The federal government must convince other levels of government to show leadership in a similar manner.
- c) The federal government should develop a recognition program for institutions (universities, colleges, school boards) which adopt advanced standards. Provincial funding to those institutions could vary according to the standards adopted and implemented.
- d) Achieving advanced standards often requires infrastructure planned at the community or campus level. Federal funding could support this.

Q2. Considering provincial programs for efficiency retrofitting of buildings, how could federal (existing or new) programs further incentivize energy efficient renovations?

There are a number of answers to this question:

- a) These types of programs can be effective. The objectives, standards, and method of evaluating must be clear.



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- b) The environmental benefit of retaining an existing building, or as much of it as possible, needs to be recognized. There are savings in embedded energy, in avoidance of some new materials and systems, and avoidance of landfill. When parts or all of an existing building cannot be retained, it should be deconstructed rather than demolished.
- c) Often the more complex buildings are not included in retrofitting programs because of their cost. Programs need to be developed to address these buildings.

Q3. Both climate and the carbon footprint of predominant energy sources vary between provinces/territories and latitudes in Canada. How could federal policy and program investments be regionally targeted to yield the greatest return in emissions reduction?

This is a complex issue that is as much, if not more, political than technical. It is not within the RAIC's expertise, but some comments are offered.

Regarding latitude, the further north one goes the more significant renewable energy becomes. In northern communities, diesel is shipped in using fuel for transportation. Any reduction is saved twice.

GHG savings can be addressed according to the predominant fuel type used in a region. Where hydro-generated electricity is prominent, it is generally vehicles that are producing GHGs. Where electricity is generated by hydro-carbons, another source for generating electricity must be found.

The country has considered east-west pipelines, why not an east-west national electricity distribution network with renewables contributing to it?

Q4. How can we further accelerate net-zero energy housing becoming market feasible?

Design knowledge and construction materials, systems, and skills are approaching maturity in many areas of the country and become more affordable with time. Acceleration of net-zero development at that scale will require improved access to the electrical grid, and improved ability for local utilities to manage the grid accepting multiple non-utility generators. The term housing should include rental as well as ownership. Social housing programs should be net zero. Energy performance should be part of the requirements for approval of any renovations to existing buildings.

Many other things are standing in the way of net-zero housing.

The cost will be an issue for buyers. Tools are required to demonstrate the savings in utility bills relative to the cost of mortgage payments. Vehicles are advertised now based on payments rather than total cost. A similar strategy can be adopted for housing. For example, "a net zero residence will save you this much monthly compared to a standard house."



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Many housing markets have moved beyond the affordability range of new home buyers which raises many other issues. At some point, a national housing policy will be needed to address a generation of Canadians who cannot afford housing, and this will provide an opportunity for new standards.

Many housing markets are seeing smaller houses demolished and replaced by large ones that show no evidence of energy efficiency.

While architects, engineers, and builders are capable of designing and building net-zero housing in many parts of the country, market forces, zoning, and other policies make net-zero an exception.

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