Moving Toward a Low-Carbon Economy:
Innovation and Investment in Canada’s
Green Building Sector

SENATE COMMITTEE ON ENERGY, THE ENVIRONMENT AND
NATURAL RESOURCES
Ottawa, October 19, 2017

Green Building Can Help Achieve the Federal
Government’s GHG Commitments
Canadian Leadership in Green Building Creates Jobs and Economic Growth

Green building already contributes significantly to the Canadian economy

<table>
<thead>
<tr>
<th>Green Building Industry</th>
<th>Total GDP</th>
<th>Jobs</th>
<th>Direct, Indirect, and Induced</th>
</tr>
</thead>
<tbody>
<tr>
<td>In 2014, Canada's green building industry:</td>
<td>$23.45 billion in GDP</td>
<td>297,890 direct jobs</td>
<td>$62.3 billion in total GDP over their lifetime (direct, indirect, and induced)</td>
</tr>
<tr>
<td>The portfolio of LEED buildings in Canada certified between 2005 - 2015 will:</td>
<td></td>
<td>701,700 jobs</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$128.0 billion in gross output (direct, indirect, and induced)</td>
<td></td>
</tr>
</tbody>
</table>

In 2014, the green building industry employed 297,890 direct full-time workers, this represents more Canadians employed than in the forestry, oil and gas, and mining industries combined.

Zero-Carbon Buildings Drive Innovation and Create the Low Carbon Building Sector of the Future
A Shift in Focus: From Energy to Carbon

The carbon-intensity of energy sources matters. Two identical, equally energy-efficient buildings in Quebec, one is emitting thirty-six times as much greenhouse gases as its twin.

Canadian Innovation through Zero Carbon Buildings

- Zero carbon buildings are the next frontier of the low-carbon economy
- CaGBC is positioning Canada to lead in this space with the development of the Zero Carbon Building Standard, including 16 pilots with industry and the federal government

CaGBC's Zero Carbon Building Standard is a made-in-Canada solution to reduce carbon emissions, providing a path for both new and existing buildings to achieve our climate change commitments
Zero Carbon Buildings as the New Performance Benchmark

CaGBC's Zero Carbon Building Standard is a made-in-Canada solution to reduce carbon emissions, providing a path for buildings to achieve our climate change commitments.

**The Key Components of the Zero Carbon Building Standard**

1. **Zero Carbon Balance**
   - No net greenhouse gas (GHG) emissions are associated with building operations. GHG emissions are offset by generating renewable energy, reducing or eliminating.

2. **Efficiency**
   - New construction projects consider peak energy use, efficiency, and lifecycle cost savings, and incorporate strategies that lower overall energy demand.

3. **Renewable Energy**
   - Leverage renewable energy to transition the new construction projects to provide residents, investors, and stakeholders with a comprehensive energy solution.

4. **Low-Carbon Materials**
   - An assessment of the carbon associated with structural and envelope materials—final rubble—leading to more environmentally sustainable decisions.

---

**GHG Emissions Reduction Potential through Zero Carbon New Construction**

NEW BUILDINGS > 25,000 sq. ft

**NET ZERO CARBON**

2016 to 2030

-17% GHG emissions from 2005 levels

7.5 Mt CO₂e
### International Leadership in Net Zero New and Existing Buildings

Other jurisdictions are deploying government policies to drive net zero innovation in new and existing buildings

**European Union**
- All new public buildings must be built to nearly zero energy, effective December 31, 2018 (Energy Performance of Buildings Directive, 2016)
- Mandatory energy reporting and labelling for all public buildings. Labels must be displayed in a visible location on-site (Energy Performance of Buildings Directive, 2016)

**United States**
- U.S. Department of Defence commitment to developing net zero new buildings by 2030 (Strategic Sustainability Performance Plan FY 2011)
- U.S. General Services Administration adopts LEED Gold requirements for all new federal buildings (GSA # 10691, 2010)
- Federal mandate to retrofit all pre-2025 buildings to zero net energy use by 2050
- Government agencies must follow strict energy consumption targets for major renovations resulting in net-zero energy use by 2030
- Government agencies must recommission buildings every four years (Energy Independence and Security Act (EISA), 2007)

**United Kingdom**
- All new public sector buildings must be built to net zero carbon emissions effective starting 2018 (Department for Communities and Local Government, 2009)
- Mandatory energy reporting and labelling for all public buildings. Labels must be displayed in a visible location on-site (EU Energy Performance of Buildings Directive)

**Japan**
- Move towards zero net energy buildings by increasing zero-emission sources of energy to 70% and setting energy-saving standards (Ministry of Economy, Trade and Industry, 2012)

---

### Accelerating Uptake on Building Retrofit is Critical in Achieving Climate Change Targets
50% of today’s existing building stock will still be in use in 2050.

Available energy savings within this building stock are estimated at 20-40%.

GHG Emissions Reduction through Existing Buildings

Pathway to Improved Performance in Existing Buildings

- Recommission 80% of buildings that haven’t undertaken any retrofits towards high-performance standards
- Undertake deep retrofits in 60% of buildings to high-performance standards (e.g. LEED)
- Incorporate solar or other renewable energy onsite systems in 40% of buildings
- Work with jurisdictions and the private sector to switch fuel sources in 20% of buildings

GHG reduction opportunity from 100,000 large buildings over 25,000 square feet and multi-unit residential buildings 5-stories or higher.
CaGBC, Building Solutions to Climate Change Report (2016)
Addressing Building Emissions Requires a Nationwide Perspective

Electricity Grid Carbon Intensity is only one factor contributing to total carbon emissions from buildings. Emissions are also impacted by building efficiency, the forms of energy used, and total building floor area in a given region.

A Roadmap for Retrofits in Canada Shows the Way to an Efficient and Low Carbon Building Sector

- High Carbon Grid
  - Recommissioning: 60% above 200,000 ft² & 40% of buildings over 15,000 ft²
  - Deep Retrofits: 40% over 35 years old and 40% of electric resistance heated
  - Renewables: 50% of all buildings
  - Fuel Switching (electrification): 20% over 35 years old

- Moderate Carbon Grid
  - Recommissioning: 60% above 200,000 ft² & 40% of buildings over 15,000 ft²
  - Deep Retrofits: 40% over 35 years old
  - Renewables
  - Fuel Switching (electrification): 20% over 35 years old

- Low Carbon Grid
  - Renewable energy
  - Fuel Switching (electrification): 100% over 35 years old
Reducing the Federal Government’s GHG Emissions: CaGBC Can Help Deliver Results

Recommendations for Government-Owned Buildings

1. Adopt the Zero Carbon Building Standard as a third-party verification for new and existing buildings that are federally owned or leased.
2. Upgrade the 2005 green building policy for new builds to LEED Platinum.
3. Formally implement a LEED Platinum policy for retrofits of large existing buildings across the entire portfolio of government buildings.
4. Deploy the Investor Confidence Project as a “performance assurance” tool for building retrofits within the federal government portfolio.
Meeting Federal GHG Emissions Targets: CaGBC Can Help Deliver Results

Recommendations for Industry and Government-Funded Buildings

5. Adopt the Zero Carbon Building Standard as a third-party verification for new and existing buildings that receive funding through federal programs.

6. Create roadmaps for targeted retrofit investments in each jurisdiction for federal federally-funded commercial, institutional and MURB retrofits.

7. Deploy the Investor Confidence Project as a “performance assurance” tool for federal initiatives that provide funding for building retrofits in the commercial, institutional and multi-unit residential buildings.
   - For example, projects should be required to complete an IREE certification in order to access funding through the Low Carbon Economy Fund, the Canada Infrastructure Bank and the National Housing Strategy

8. Use the Canada Infrastructure Bank as a loan guarantor to de-risk investment in retrofits and support the maturation of the retrofit market in Canada.

Appendix
CaGBC is Building Industry Capacity for the Low-Carbon Economy

CaGBC provides thought leadership by developing leading research, delivering education programs, supporting industry capacity, and introducing new standards and certification to evolve the next generation of green buildings in Canada.

Core Elements to Grow Canada’s Low-Carbon Building Stock

- **Innovation**: in Zero Carbon design and construction to foster the next generation of green buildings
- **Information**: to drive existing building retrofits by overcoming the data void in buildings through research and energy benchmarking
- **Investment**: in existing buildings through de-risking finance to improve investor confidence and scale retrofit projects across Canada
- **Develop New Industry Standards**
  - Zero Carbon Building Standard for Commercial, Institutional and Multi-Family Buildings in Canada (new and existing)
- **Advance Innovative Policies**
- **Provide Pathways to Meet Climate Change Targets**
  - A Roadmap for Retrofits in Canada
  - Building Solutions to Climate Change: How Green Buildings Can Help Meet Canada’s 2030 Emissions Targets

Deliver State of Industry Reports
- Green Buildings in Canada: Assessing the Market Impacts and Opportunities
- Healthier Buildings in Canada 2016: Transforming Building Design and Construction

About the Canada Green Building Council (CaGBC)

**Who We Are**

- A not-for-profit, national organization working to advance green building and sustainable community development practices in Canada.
- Industry-led, cross-sectoral stakeholders and members focusing on delivering market-based solutions
- Membership:
  - Spans 12 provinces and territories
  - 1,300 national member companies and 3,000 chapter members
  - 10,000+ LEED accredited professionals involved in designing, building and operating buildings, homes and communities

**What We Do**

- We deliver green building performance standards and certification programs, industry support and capacity building
- We provide technical expertise, research and thought leadership
- We build strategic & business partnerships to achieve sustainability goals
Contact:

**Thomas Mueller**  
President & CEO  
Canada Green Building Council  
tmueller@cagbc.org

**Akua Schatz**  
Director, Advocacy and Development  
Canada Green Building Council  
aschatz@cagbc.org