

Report on the Green Rehabilitation and Sustainability Forums:

Victoria, Kelowna, Vancouver,
British Columbia

2008-2009



Working Together to Transform the Built Environment: Green Rehabilitation in Climate Action

Cascadia Region Green Building Council with Funding from BC Heritage Branch, Ministry of Tourism, Culture & Arts



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Photos credit Heritage Branch, Province of British Columbia



SUMMARY OF THIS REPORT

This report documents the outcomes of the Green Rehabilitation and Sustainability Forum in British Columbia, in 2008-09.

In Canada, buildings are responsible for: 33% of energy use; 12% of non-industrial water consumption; 50% of natural resource consumption; 35% of greenhouse gas emissions; 10% of airborne particulate production; and 25% of landfill waste generation. Green rehabilitation - which applies green building standards such as LEED or the Living Building Challenge™ to heritage and other existing buildings - is a strategy for achieving major reductions in emissions.

Green rehabilitation is an opportunity to respond to climate change through the transformation of the built environment, but projects are faced with challenges. There are disconnects between policies, legislation, systems and standards for green buildings, building codes and heritage conservation in Canada. Also, capital costs may be higher for green rehabilitation than for a new construction or renovation.

The Forum brought together policy-makers, LEED experts, architects, planners, building officials, heritage consultants, developers and contractors in a dialogue on how to remove barriers to project delivery. Participants identified issues and ideas that are presented in the report as recommendations to inform and guide decisions on how to leverage the powerful potential of green rehabilitation to impact climate change. Implementation of the proposals for action will depend on public, private and third-sector investment and partnerships.

The agenda for action has eight goals, each with recommendations under them:

- **Retrofit and Reuse** Heritage and Existing Buildings
 - Connect with federal programs for economic growth and climate action.
 - Create a larger market for major renovations with lower consumer energy costs.
 - Set targets and benchmarks for green rehabilitation.
- **Reinvest** in Historic Areas and Neighbourhoods
 - Plan sustainable communities with population and economic growth in historic and older neighbourhoods.
- **Connect** Systems and Standards
 - Advocate for the revision of LEED and LEED Canada to create stronger recognition of the value of heritage.
 - Overcome conflicts between LEED Canada and the Standards and Guidelines core principle of minimal intervention in historic buildings.
 - Address the impact of green building code requirements on heritage buildings.

- Remove obstacles to reuse that arise from the BC Homeowners Protection Act.
- **Support** Incentives for Change
 - Introduce federal tax credits for heritage conservation as well as reuse of commercial and industrial buildings.
 - Deliver federal and provincial grants for green rehabilitation capital projects, including seismic upgrades.
 - Implement municipal property tax incentives for heritage conservation.
- **Build** Partnerships
 - Exchange information and expand cooperation between policymakers for economy, environment, energy, heritage, municipal planning and building standards.
 - Support the construction industry in green rehabilitation.
 - Forge alliances with organizations across the sectors of construction, environment, energy, heritage and community planning, and with governments.
- **Further** Research and Development
 - Establish a Canada-wide research program on the Life Cycle Assessment of Historic and Existing Buildings.
 - Conduct further energy upgrade modeling of historic buildings.
 - Link research to policy development.
- **Develop** Best Practices
 - Develop a standardized approach to projects that brings together a team of building and heritage professionals and integrates the separate models for sustainable design and sensitive heritage conservation.
 - Make it best practice in the integrated design process to consider the strategies, synergies and tradeoffs which can earn LEED Canada credits, and meet the Standards and Guidelines for heritage rehabilitation.
 - Assess and balance the environmental, economic and social impacts of heritage projects.
- **Raise** Awareness
 - Raise the national profile of initiatives to gather and expand public and private support.
 - Inform and educate about a life cycle economy and the impact of construction on the environment.
 - Exchange experiences, advice and expertise between building and heritage professionals.

Continuing a dialogue between governments, organizations and industry is essential and can take forward the implementation of green rehabilitation projects in British

Report on the Green Rehabilitation and Sustainability Forum, British Columbia

Columbia, and throughout Canada. Working together, we can transform our built environment for a sustainable future.

GREEN REHABILITATION IN CLIMATE ACTION

“Because it necessarily involves the conservation of energy and natural resources, historic preservation has always been the greenest of the building arts... preservation is the ultimate recycling.”

Richard Moe, President, United States National Trust of Historic Preservation

Canada and Canadians are committed to the future of a sustainable planet. Federal, provincial, territorial and municipal governments are responding to the urgency of the environmental issue of climate change through a transformational shift in policy. In the 2007 Throne Speech, the B.C. government, for example, set targets to reduce greenhouse gas emissions no less than 33 percent by 2020.

Every year, around 40 percent of Canada’s carbon dioxide emissions are caused by new construction. Also, inefficient buildings are heavy users in systems operations and maintenance. 17 percent of home energy use in B.C. in 2006, for instance, went to heating, air conditioning, electric appliances, home electronics and lights.

The Canada Green Building Council is leading the way forward to a national building-centric strategy to address climate change through LEED Canada. LEED has massive potential to transform our built environment and to reduce the level of greenhouse gases, while increasing energy efficiency. Green rehabilitation is an effective strategy for major reductions in greenhouse gas emissions, resource depletion and energy consumption in response to global ecological pressures.

Figure 1: Vancouver Tour View of the Dominion Building



Green rehabilitation of heritage buildings avoids the environmental harm of new construction while conserving the embodied energy of existing buildings. It is a powerful means of reducing carbon dioxide emissions, saves valuable resources, and has the economic benefits of lower energy and water costs. There is added value in the durability of pre-1930s construction and its energy-conservation features, such as sash windows with storms, entrances that block sun, retain heat, or provide natural ventilation, all of which exemplify responsiveness to local climatic conditions through ecological design.

Canada's historic places are also invaluable and irreplaceable resources and heritage retention contributes to economic, social and cultural sustainability. Rehabilitation not only reduces demolition waste, it is a source of economic vitality, creates local jobs, and ensures a sense of continuity in neighbourhoods that enhances the livability of communities.

Figure 2: Flack Block Tour



Photo credit Jessica Woolliams

GREEN REHABILITATION AND SUSTAINABILITY FORUM

Victoria, Kelowna and Vancouver, British Columbia, 2008-09

More than 100 building and heritage professionals from provincial ministries, municipalities, non-government organizations and the private sector participated in the Green Rehabilitation and Sustainability Forum. The Forum was a series of three workshops in Victoria, Kelowna and Vancouver, British Columbia, held respectively on 25-26 November 2008, 9-10 December 2008 and 19-20 January 2009.

A partnership between the Cascadia Region Green Building Council (Cascadia), and the Heritage Branch of the BC Ministry of Tourism, Culture and the Arts, these workshops were the outcome of a co-organized policy summit on green rehabilitation in April 2008. Participants in the earlier discussion had identified the reuse and improvement of heritage and other existing buildings as a priority action for environmental design. Both the Forum and summit were also informed by a previous workshop on heritage conservation and sustainability at Simon Fraser University, Vancouver, in 2007, which had drawn attention to the reality that in many cases, “the greenest building is one that already exists.”

The Forum was an innovative event that brought together policy-makers, LEED experts, architects, planners, building officials, heritage consultants, developers and contractors to consider the challenge and opportunities for green rehabilitation in climate action. Despite many professional interests and expertise, the attendees shared common goals of building, design and development policy, including:

- Creating the conditions for transforming the built environment by **improving the connectivity** between standards and codes for green building in new construction and major renovations, and conservation of historic buildings.
- Implementation of **green rehabilitation projects** through legislation, policy, rating systems, regulations and practices that are enabling, and adequately flexible to ensure retention of character-defining elements in historic buildings.
- Protecting the **social and cultural values** invested in historic buildings, districts and neighbourhoods as non-renewable resources to communities.

To provide a platform for conversation between the stakeholders, speakers introduced the standards for green building, heritage conservation and construction that are required in green rehabilitation projects, but are not fully integrated. Successes and obstacles were illustrated through presentations on case study projects in Victoria, Kelowna and Vancouver.

The requirements from LEED Canada, the Living Building Challenge, the National Standards and Guidelines for the Conservation of Historic Places in Canada and building codes in B.C. are summarized in the next section of this report as background

to the issues identified at the Forum. Forming an agenda for action, participants made recommendations for professional practices and local, provincial and federal policy.

BACKGROUND

About Cascadia Region Green Building Council

Cascadia's mission is to promote the design, construction and operation of buildings in Alaska, British Columbia, Washington and Oregon that are environmentally responsible, profitable and healthy places to live, work and learn.

The Cascadia Region Green Building Council is the oldest chapter of the Canada Green Building Council and is also one of three original chapters of the U.S. Green Building Council. It is the only international chapter in North America. Incorporated in Oregon in December 1999, the chapter covers Alaska, BC, WA and OR, but also includes members from as far away as Idaho and Montana. Cascadia continues to serve its members by helping the Canada and U.S. Green Building Councils meet their goals in the Cascadia region. We strive to become a leading force in green building by forging alliances with organizations that have a stake in the future of this region.

The chapter is named for the Cascadia bioregion, which covers land that drains to the Pacific Ocean through the greatest temperate rain forests on the planet. Members of the Cascadia council are leading the way in creating a roadmap for sustainable building, one that the rest of the nation can use as well. Many key developments have already occurred, including:

- The City of Vancouver adopted a minimum requirement of LEED Gold for all new civic buildings greater than 500 square meters.
- The City of Seattle adopted a sustainable building policy and became the first city in the nation to adopt LEED, the U.S. Green Building Council's green building rating system, as the municipal design standard and performance measurement tool.
- The city of Portland also adopted a green building policy and funded a Green Building Initiative, which is designed to expand market demand and provide technical services and resources for the building industry.

Above is a short list of early wins, and there continue to be many added to this regularly.

The International Living Building Institute

In May 2009, Cascadia launched the International Living Building Institute¹, a new entity currently housed within Cascadia. The Institute is devoted to encouraging the creation of Living Buildings™, Sites and Communities in countries around the world while inspiring, educating and motivating a national and global audience about the need for

¹ <http://www.ilbi.org>

fundamental and transformative change. The Institute is committed to raising the Living Building Challenge's profile in Canada and the United States and serving as the go-to resource for policy makers and building professionals interested in transforming the built environment.

The Institute is a non-governmental organization (NGO) dedicated to the creation of a truly sustainable built environment in all countries around the world. Comprised of the leading green building experts, futurists and thought-leaders, the Institute is dedicated to the belief that providing a compelling vision for the future is a fundamental requirement of reconciling humanity's relationship with the natural world.

The Living Building Challenge

The purpose of the Living Building Challenge² is straightforward – to define the highest measure of sustainability attainable in the built environment based on the best current thinking – recognizing that 'true sustainability' is not yet possible. The Living Building Challenge is by definition difficult to achieve. Although facets of this standard have been accomplished in numerous projects around the world, prior to the release of Living Building Challenge, no single project integrated all of the program's requirements in its entirety.

With this standard, the International Living Building Institute aims to encourage dialogue on the necessary evolution of the building industry and engender support for the first pilot projects, until more and more Living Buildings emerge.

This level of building was discussed within the forums, and participants agreed that heritage buildings are good fits for this level of building.

Canada Green Building Council

The mission of the Canada Green Building Council (CaGBC)³ guides their work. It is to lead the transformation of the built environment to create buildings and communities that are environmentally responsible, profitable, and healthy places to live, work and play, through the engagement and enablement of industry and government and the support of related organizations to accelerate sustainable building and development in Canada.

The CaGBC's vision is a transformed built environment leading to a sustainable future. To that end, the Council will work to:

- Change industry standards,
- Develop best design practices and guidelines;
- Advocate for green buildings, and

² <http://ilbi.org/the-standard>

³ <http://www.cagbc.org/>

- Develop educational tools to support its members in implementing sustainable design and construction practices.

Leadership in Energy and Environmental Design

The Leadership in Energy and Environmental Design Canada (LEED Canada) Green Building Rating System™⁴ encourages and accelerates global adoption of sustainable green building and development practices through the creation and implementation of universally understood and accepted tools and performance criteria.

LEED Canada is a third-party certification program and an internationally accepted benchmark for the design, construction and operation of high performance green buildings. It provides building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance.

LEED Canada promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health:

- Sustainable site development
- Water efficiency
- Energy efficiency
- Materials selection
- Indoor environmental quality

Credits and Prerequisites are organized into these five categories. An additional category, Innovation & Design Process, addresses sustainable building expertise as well as design measures not covered under these five environmental categories.

Certain rating systems include additional relevant categories. LEED Canada for Homes, for instance, includes a Location and Linkages category and an Awareness and Education category.

Certification is based on the total point score achieved, following an independent review and an audit of selected Credits. With four possible levels of certification (certified, silver, gold and platinum), LEED is flexible enough to accommodate a wide range of green building strategies that best fit the constraints and goals of particular projects.

The Canadian rating systems are an adaptation of the US Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Green Building Rating System™, tailored specifically for Canadian climates, construction practices and regulations. The rating systems are adapted to the Canadian market through an inclusive process that engages stakeholders and experts representing the various sectors of the Canadian industry.

⁴ <http://www.cagbc.org/leed/what/index.php>

Those most relevant credits to green rehabilitation are below. Most of the discussion at the Forum was focused on LEED Canada-New Construction.

LEED® Canada for New Construction and Major Renovations 1.0 (LEED Canada-NC)

- Used for renovations that impact the building envelope and are worth at least 50 percent of the property value.

LEED® for Existing Buildings: Operations & Maintenance (LEED Canada-EBOM)

- Used for projects less than 50 percent of a property's value.

Major renovations to heritage and existing buildings can theoretically earn points in every performance area of LEED Canada-New Construction, but materials selection and sustainable site development are the most obvious. The first includes building reuse, construction waste management, resource reuse and building durability credits. The second rewards the selection of developed and contaminated sites as well as density of the area immediately surrounding a site.

National Standards and Guidelines for the Conservation of Historic Places

The Standards and Guidelines for the Conservation of Historic Places in Canada (referred to as the Standards and Guidelines)⁵ are a national framework for best practices in historic preservation, rehabilitation and restoration. Parks Canada, under the Historic Places Initiative, is responsible for the Standards and Guidelines. Based on international principles, they are used across the country to guide decisions about repairs and alterations to national, provincial and municipal built heritage.

The standards are universal principles for conserving the **heritage value** of historic sites through the conservation of **character-defining elements**. Heritage value is the aesthetic, historic, scientific, cultural, social or spiritual significance of historic places for past, present and future generations. Character-defining elements are the materials, form, location, spatial configuration, use and cultural meanings of a historic building, or other place, that must be protected if essential to heritage value.

The motherhood principle for design and construction that involves heritage structures and sites is minimal intervention. There are specific guidelines to apply the standards to exteriors and interiors, including building elements such as wood, masonry, windows, entrances and porches, and structural and mechanical systems.

The Standards and Guidelines include principles that promote and support the integration of sustainable building and rehabilitation. They also suggest that green performance systems should explore the energy efficiency of heritage buildings. Benefits include embodied energy and inherent energy-conserving features such as sash windows with storms and entrances that block the sun, retain heat, or provide natural ventilation.

At the same time, these principles require that changes to historic buildings for environmental purposes, e.g. energy efficiency, must not alter, damage or destroy character-defining elements or undermine heritage value.

⁵ <http://www.pc.gc.ca/eng//docs/pc/guide/nldclpc-sgchpc.aspx>

Greening Building Codes in British Columbia

The Province of British Columbia has set ambitious targets for energy conservation and climate action. Supporting the Province's commitment to reduce greenhouse gas emissions, the BC Ministry of Housing and Social Development has introduced new green Building Code requirements, effective September 2008.⁶

The BC Office of Housing and Construction Standards is responsible for the development and implementation of the provincial Building Code. Initial changes to existing regulations were added as Part 10 of the Code, which requires better energy and water efficiency in all new construction and renovations, as shown below.

Figure 3: Participants of Vancouver Summit and Flack Block Tour



⁶ <http://www.housing.gov.bc.ca/building/green/>

Energy Conservation

- Higher standards for insulation for single-family dwellings and multi-family residential, commercial and industrial buildings of five stories or less, with an EnerGuide rating of 77 as an alternative in houses;
- Requirements for energy use in high-rise multi-family residential buildings and larger industrial, commercial and institutional buildings to meet the standards of the internationally recognized ASHRAE 90.1 rating system* ⁷

Water Conservation

- Mandatory water-saving plumbing fixtures and fittings, such as ultra-low flow toilets, for new construction of every building type and renovations.

The next steps in greening the B.C. Building Code will consider other issues such as grey water recycling and the reuse of existing buildings. An alternative compliance schedule for heritage buildings will apply under Part 10, similar to other sections of the Code. The latter is needed where interventions to increase energy and water efficiency significantly alter, damage or destroy the character-defining elements of heritage buildings.

It should be noted the B.C. Building Code is applied province-wide except for the special case of Vancouver, which has the Vancouver Building Code. Under the Province's *Vancouver Charter* legislation, the City is delegated the authority to enact building bylaws that are used instead of provincial regulations. Vancouver is also greening the Vancouver Building Code.

⁷ American Society of Heating, Refrigeration and Air-Conditioning Engineers rating system, ASHRAE 90.1

Cascadia's Code and Regulatory Work

Cascadia has in 2009 done extensive research into the current regulatory obstacles to innovative green technologies and approaches, such as green roofs, rainwater harvesting, greywater use, composting toilets, and urban agriculture. Cascadia has done critical work in this area with the City of Vancouver, Washington and Clark County, and has published three reports⁸ focused on action - learning how to get out of the way so that Living Buildings can be built. These include:

1. Report #1: Findings highlighted the obstacles project teams may encounter when seeking approval for a Living Building Challenge project. Some of the barriers found were directly related to City and County regulations, while others extended beyond the authority of the local jurisdiction to the state level.
2. Report #2: Strategies and Recommendations provided a prioritized list of key barriers with short and long term recommendations for overcoming those barriers.
3. Report #3: Costs and Benefits, provides some understanding of the costs of implementing each of the twenty-one recommendations identified in Report #2 and provides a summary of the environmental, societal, and financial benefits of sustainable, affordable, and residential development. The report also provides developers of single and multi-family residential projects with a range of additional first costs for developments, which strive to achieve the Living Building Challenge. Finally, the payback period for investing in single and multi-family residential buildings, which strive to attain this high level of sustainability, was evaluated against water and energy costs in the City of Vancouver and Clark County.

More detailed work needs to be done to bring in heritage and existing building concerns with respect to these issues.

British Columbia Homeowners Protection Act

The BC Ministry of Housing and Social Development also has a watchdog agency, the Homeowners Protection Office (HPO)⁹, which regulates the construction quality of new homes throughout the province of British Columbia. The HPO was created in 1998 under the Homeowner Protection Act to ensure homebuilders are licensed and housing materials and building envelopes have warranties. Under the Act, "new homes" includes strata units in newly built complexes and strata conversions of existing residential, industrial and commercial properties.

Developers of adaptive re-use condominiums are finding it difficult to secure the legally required coverage from warranty providers, without the replacement of in-situ

⁸ <http://www.ilbi.org/resources/research/CodeStudies/codestudy>

⁹ <http://www.hpo.bc.ca/>

membranes and windows with new laboratory-tested and rated assemblies. Deconstructing historic buildings in this way is in conflict with conserving their character-defining elements and protection of heritage value.

BC Heritage Branch and Heritage BC have been working with the Homeowners Protection Office and the BC Ministry of Housing and Social Development to seek a solution that would recognize the durability, and consequently the environmental sustainability, of heritage building envelope systems to mitigate the problem.

○



Figure 4: Entrance to Flack Block, part of the Vancouver Forum

ISSUES AND OUTCOMES

Participants in the Green Rehabilitation and Sustainability Forum began to build an agenda for action in response to the challenge of climate change. Some of the issues and priorities that were identified are highlighted below.

1. Retrofit and Reuse Heritage and Existing Buildings

A variety of policy areas and tools exist for green retrofits and reuse of heritage and existing buildings. Ministries, agencies and organizations can find ways to coordinate their goals and activities to accelerate change.

- There are opportunities to connect with the recent federal budget incentives for economic growth and climate action, i.e. Home Renovation Tax Credit¹⁰, and EnerGuide.
- National and provincial cooperation to harmonize standards and codes for retrofits and reuse can create a larger market for major renovations in the construction sector and can benefit consumers with lower energy costs.
- Setting numerical targets for heritage-sensitive projects can help to mainstream green rehabilitation in building design and development.

2. Reinvest in Historic Areas and Neighbourhoods

Municipalities can use the environmental, social and economic benefits of retaining and improving heritage and other buildings to revitalize communities. Sustainable community planning can add value to reinvestment in historic and older neighbourhoods.

- Targeting growth to developed areas of communities reduces sprawl and demand for new infrastructure.
- Main Street programs, which fund the revitalization of historic downtown commercial districts, often help to rebuild and sustain local economies.
- Invest in projects, which realize the goals of city or town planning to improve livability, such as the provision of social housing, cultural facilities or other community or neighbourhood amenities in heritage buildings.

¹⁰ <http://www.cra-arc.gc.ca/gncy/bdgt/2009/fqhmrvtn-eng.html>

3. Connect Systems and Standards

More, better and ongoing connectivity between the respective performance systems and standards for green building, heritage conservation and new construction and renovations can remove the barriers to retrofits and reuse of heritage and existing buildings.

While most existing buildings can achieve LEED certification with minimal effort¹¹, a silver rating is readily achievable and gold is possible, there are ways to improve the performance criteria.

- LEED should consider further credits for the retention of heritage buildings as vital to cultural sustainability in communities.
- More could also be done in LEED-New Construction to award points for the durability, embodied energy and inherently green elements and systems, such as storm windows and natural ventilation, of historic buildings and traditional assemblies.
- Rehabilitation and reuse can be accelerated by overcoming conflicts between LEEDCanada and the Standards and Guidelines conservation principle of minimal intervention in historic buildings.
 - Historic elements, such as brick facades, can be damaged or destroyed in alterations to satisfy LEED checklist items, including thermal insulation, additional views or daylight and local materials. Sash windows are often replaced without consideration for heritage character or the option to repair them to improve efficiency.
 - LEED Canada could better integrate the Standards and Guidelines, which offer guidance on retrofits, and additions to heritage buildings for major renovations.
- Improved environmental standards for new construction and renovations in regulations, such as the B.C. and Vancouver building codes, are furthering green building but may threaten heritage value and features.
 - There is need for clear signals about the impact on heritage and to consider options for regulatory measures, consistent with the Standards and Guidelines. The best solution may be updates to the existing alternate compliance schedules for heritage buildings in the codes that satisfy the new objectives for water and energy efficiency.
 - A set of best practices on the application of Code objectives and equivalency schedules could be gathered and communicated as guidance

¹¹ Major points for rehabilitation can be earned under Materials & Resources in LEED-NC.

for building inspectors. Guidelines and examples of use could be posted on a website, blog or email list, and/or published.

- Obstacles to conversions of existing buildings to residential use in British Columbia that arise from the Province's *Homeowner Protection Act (HPA)* should be removed. An exemption for heritage assemblies that had proved their durability from the HPA would enable green rehabilitation projects.
 - While the risk protection of homeowners is reasonable, it is a burden on developers to force these projects to secure warranties for envelope failure and other problems using standards for new construction. Also, the legal standards typically result in damage to the value and fabric of historic buildings.

4. Support Incentives for Change

Financial and tax incentives are proven to stimulate investment in green building and heritage conservation projects in other countries and Canada, but going beyond current support for rehabilitation and reuse would accelerate change.

- New Federal tax credits to renovate homes for higher energy efficiency are helpful and can be further supported through complementary ones for heritage conservation, and reuse of commercial and industrial buildings.
- Federal and provincial grants can generate interest in green rehabilitation.
 - Financial support for capital projects could follow a cost-sharing model, such as Parks Canada's new initiative for improvements to National Historic Sites.
- Local governments can offer municipal property tax relief in exchange for the rehabilitation of heritage buildings, and other incentives.
 - Schemes may be modeled after the City of Victoria's successful Tax Incentive Program.

5. Build Partnerships

Retrofits, reuse and reinvestment in heritage and existing buildings and neighbourhoods are achievable through regular communication and partnerships between governments, industry and organizations. There are opportunities to connect and coordinate initiatives.

- **Government** policymakers for economy, environment, energy, heritage, municipal planning and building standards can exchange information and expand cooperation on sustainability strategies.¹²
 - Lessons to inform green rehabilitation policy can be learned from Public Works and Government Services Canada's new Sustainable Heritage Rating System, launched in 2009.
 - In 2010, Parks Canada is releasing an updated version of the Standards and Guidelines, which will expand the consideration of green building criteria in heritage projects. These changes could form part of the Sustainable Building Policy of the Office for Green Government, also expected in 2010, and other national programs including the Home Renovation Tax Credit.
 - In the provinces, inter-Ministry partnerships are useful. For example, the Heritage Branch of the BC Ministry of Tourism, Culture and Sport was a member on committees for the greening of the B.C Building Code. Provincial governments can also help municipalities to achieve goals through financial support, education and research and development.
 - Local governments can form action networks for green rehabilitation to share experiences, advice and knowledge.
- **Construction industry** activity in green rehabilitation can be supported through help from governments and organizations.
 - Given the capital costs for rehabilitation, especially seismic upgrades, more government financial and tax incentives, can stimulate private-sector investment in heritage and existing buildings.
 - Municipal planners and building officials can further assist developers and property owners through the approval of alternate code compliances and zoning variances to make projects feasible.
 - Information that Canada Green Building Council offers to clients could include not only the credits checklist and new green building code

¹² This type of information exchange and cooperation has already happened between Parks Canada and the Canada Green Building Council on existing standards.

requirements, but also the Standards and Guidelines for heritage conservation.

- **Organizations** across the sectors of construction, environment, energy, heritage and community planning can seek collaborative alliances with each other or governments to forward the green rehabilitation agenda.
 - Positive change often occurs through the power of collaborative work between agencies with related interests. Such collaboration is evident in the Technical Committee on Sustainability of the Association of Preservation Technology as well as other collaborative partnerships such as the one that initiated these workshops and produced this report – between the BC Heritage Branch and the Cascadia Region Green Building Council or the collaboration of the National Trust for Historic Preservation with the US Green Building Council that incorporated more recognition of the environmental benefit of conserving and upgrading existing buildings in the most recent revision of LEED. Specific recommendations in the area of collaboration include:
 - Non-governmental agencies and governmental agencies at all jurisdictional levels (local, regional, provincial, federal) involved in heritage and green buildings find ways to collaborate and work together on topics of mutual interest related to improving the environmental impact and retaining the heritage values of existing and heritage buildings.
 - In the United States, the National Trust for Historic Preservation has joined forces with the National Parks Service, the American Institute of Architects, and the Association of Preservation Technology to advance these issues. Any changes to LEED need to go through the USGBC, so therefore it is recommended that the BC Heritage Branch partner with the National Trust for Historic Preservation, Cascadia Region Green Building Council and others to develop a long term collaborative strategy to communicate with Canada GBC and the USGBC regarding greater incorporation of the full range of heritage issues mentioned throughout this report.
 - Due to the fact that the federal government is intending to make changes to the National Building Code in 2015 and that the provincial government in BC has a focus on greening the building code, that non-governmental and governmental agencies at the provincial level who are involved in heritage and green building find ways to collaborate on these initiatives to propose changes to these regulations that would improve the environmental impact and retain the heritage values of existing and heritage buildings.

- There are opportunities to partner with sustainable community planning movements, especially Smart Growth and Congress for the New Urbanism.
- Partnerships for education are also important, such as the Simon Fraser University City 2007 workshop on Heritage Conservation and Sustainability and the Vancouver Heritage Foundation's Heritage and Sustainability Guide, funded in part by the BC Heritage Branch.

6. Further Research and Development

While the reuse and retrofit of heritage and existing buildings is a LEED strategy for sustainability, more research can take advantage of the environmental benefits of building conservation.

- Parks Canada and the Athena Sustainable Materials Institute have released the report, *Lifecycle Assessment of Historic Buildings*¹³. Based on four case studies across Canada, it shows that the retention of buildings has a lesser environmental impact than demolition and new construction. The BC Heritage Branch has also undertaken a provincial sample of Lifecycle Assessment research. This work can be scaled up to a nationwide knowledge base.
- Further energy modeling is needed on the inherent energy conserving features of historic buildings, and the environmental impact of energy upgrades that retain and improve the social value of heritage.
 - The BC Heritage Branch has begun to model green retrofits.
 - Lessons can be learned from the U.S. National Trust for Historic Preservation and Berkeley University's Historic Windows Assessment Project and outcome-based energy code work at the Preservation Green Lab in Seattle, Washington.
- Linking research to policy development is critical.
 - Other provinces can follow the lead of BC Heritage Branch, which shares its analyses with the Alternative Energy Branch of the BC Ministry of Energy, Mines and Petroleum Resources, as well as organizations, such as Cascadia and LiveSmart B.C.

¹³ <http://www.athenasmi.org/publications/index.html>

7. Develop Best Practices

Green building and heritage conservation standards are both applied in green rehabilitation for historic buildings, but the standardization of an integrated design approach and best practices can facilitate projects.

- Define a standardized approach to projects that brings together a team of building and heritage professionals, and integrates the separate models for sustainable design and sensitive heritage conservation interventions.
 - Strategies and design approaches in LEED Canada can incorporate the heritage conservation decision-making model in the Standards and Guidelines, whose first step is to assess the building's heritage value and to identify its character-defining elements.
 - The Parks Canada model for heritage projects could add a step to consider LEED CANADA criteria in decision-making for conservation strategies, including the design of new additions to historic buildings.
- Make it best practice in the integrated design process to consider the strategies, synergies and tradeoffs which can earn LEED Canada credits, and meet the Standards and Guidelines for heritage rehabilitation.
- Employ detailed case studies and project team interviews to establish best practices from practitioners and projects.
- Assess and balance the environmental, economic and social impacts of sustainable heritage projects.
 - There is a need for CaGBC to incorporate the approaches and methods of social impact assessment. The United Nations Environment Programme's Life Cycle Initiative¹⁴ is a leader in this area.

¹⁴ See: <http://lcinitiative.unep.fr>

8. Raise Awareness

Broader-based and intensified training, communications and outreach can engage, inform and educate policy-makers, building and heritage professionals and the public about the power of green rehabilitation to transform our built environment in response to climate change.

- It is imperative to raise the national profile of initiatives that enable retrofits, reuse and reinvestment in heritage, existing and older buildings and historic neighbourhoods to gather and expand public and private support.
 - Heighten awareness of the environmental, economic and social impacts of historic preservation tax credits, similar to effective and federally financed programs in the United States, is important.
- Everyone from individual consumers to the vast range of professions that make up the building industry needs to understand a life cycle economy and the impact of construction on the environment.
 - Professional development workshops are useful, such as the 2007 Simon Fraser University course on Heritage and Sustainability.
 - Web-based education and publications can be effective tools. Leading examples are the BC Heritage Branch's Heritage and Sustainability web pages¹⁵, and the Vancouver Heritage Foundation Heritage and Sustainability Guide¹⁶.
 - Research needs to be done into the development of further training, resources such as case studies, and communications tools such as web forums.
- Building and heritage professionals can exchange experiences, advice and expertise at events and through e-mail list-serves and web-platforms.
 - Existing examples include the Cascadia web-forum on green building, and the searchable database on sustainable construction products posted on the Athena Institute website.

¹⁵ <http://www.tca.gov.bc.ca/heritage/sustainability/greenBuilders.htm>

¹⁶ <http://www.vancouverheritagefoundation.org/sustainability.html>

WORKING TOGETHER: AGENDA FOR ACTION

The outcomes of the Green Rehabilitation and Sustainability Forum led to a vision for action to inform and guide decision makers on how to leverage the powerful potential of historic buildings and neighbourhoods to impact climate change.

An agenda for action is given below in summary. Implementation of the proposals for action will depend on public, private and third-sector investment and partnerships.

Continuing a dialogue between governments, organizations and industry is essential and can take forward the implementation of green rehabilitation projects in British Columbia, and throughout Canada. Working together, we can transform our built environment for a sustainable future.

Figure 5: Select Participants of Vancouver Summit



RECOMMENDATIONS FOR GREEN REHABILITATION IN CLIMATE ACTION

Goal 1: Retrofit and Reuse Heritage and Existing Buildings



Photo credit Heritage Branch, Province of British Columbia

RECOMMENDATIONS	ACTIONS	LEADERSHIP
<ul style="list-style-type: none"> Connect with federal programs for economic growth and climate action. 	<ul style="list-style-type: none"> Leverage federal tax credits for residential, commercial and industrial EnerGuide upgrades and renovations. 	Industry and property owners
<ul style="list-style-type: none"> Create a larger market for major renovations with lower consumer energy costs. 	<ul style="list-style-type: none"> Promote retrofits and reuse. 	Governments and organizations
<ul style="list-style-type: none"> Set targets and benchmarks for green rehabilitation. 	<ul style="list-style-type: none"> Identify a path for acceleration and track numbers of registered and certified existing building LEED Canada-NC and LEED Canada-EBOM projects from 2010-15. Monitor provincial and national EnerGuide assessments. 	<p>Cascadia Region Green Building Council with the Canada Green Building Council</p> <p>Governments and organizations</p>

Goal 2: Reinvest in Historic Areas and Neighbourhoods



RECOMMENDATIONS	ACTIONS	LEADERSHIP
<ul style="list-style-type: none">Plan sustainable communities with population and economic growth in historic and older neighbourhoods.	<ul style="list-style-type: none">Target growth to developed communities, reducing sprawl and demand for new infrastructure.Invest in Main Street programs.	Local governments and non-governmental organizations such as Smart Growth and the Planning Institute of BC, as well as community stakeholders All levels of government

Goal 3: Connect Systems and Standards

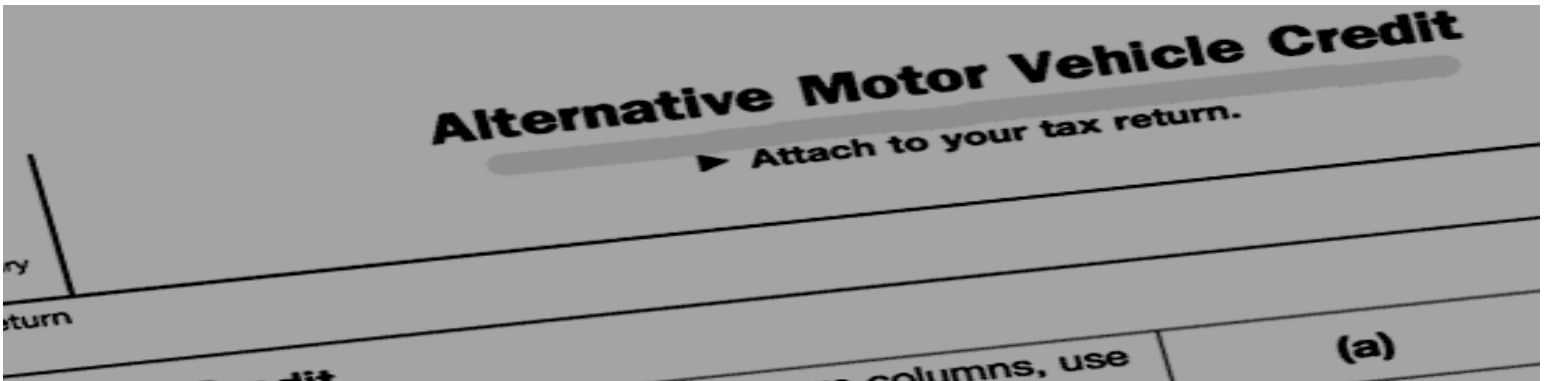


RECOMMENDATIONS	ACTIONS	LEADERSHIP
<ul style="list-style-type: none"> Advocate for the revision of LEED and LEED Canada to create stronger recognition of the value of heritage.¹⁷ 	<ul style="list-style-type: none"> Award points for the durability and energy-conservation features of historic buildings and assemblies. 	Heritage BC, along with Cascadia Region Green Building Council and the Canada and US Green Building Councils
<ul style="list-style-type: none"> Overcome conflicts between LEED Canada and the Standards and Guidelines core principle of minimal intervention in historic buildings. 	<ul style="list-style-type: none"> Identify potential conflicts in LEED Canada-NC and LEED Canada-EBOM credits. Discourage the strategy of retaining heritage facades (<i>facadism</i>) that conflicts with heritage principles. 	Cascadia Region Green Building Council with the Canada Green Building Council Parks Canada
<ul style="list-style-type: none"> Address the impact of green building code requirements on heritage buildings. 	<ul style="list-style-type: none"> Introduce equivalencies and alternate compliance options in building codes where integrity of heritage character-defining elements is at risk. Build a culture of flexibility 	Provincial government Municipal governments

¹⁷ The reason for including both LEED and LEED Canada is that LEED (developed by the USGBC) is the basis for LEED Canada, and any substantial changes to LEED Canada need to first occur within LEED.

	<p>in the application of performance-based building codes.</p> <ul style="list-style-type: none"> • Increase recognition of the efficiency of repair over replacement (i.e. for sash windows with storms) into EnerGuide and other government and non-governmental retrofit programs. 	<p>Provincial government</p> <p>Non-governmental organizations such as City Green and Cascadia Region Green Building Council</p>
<ul style="list-style-type: none"> • Remove obstacles to reuse that arise from the BC Homeowners Protection Act. 	<ul style="list-style-type: none"> • Exempt heritage from the Homeowners Protection Act requirements for home warranties, or change the legal requirements to enable the in-situ building assemblies to meet alternative compliance standards to the laboratory-approved level of performance for new homes. • Educate and network for change. 	<p>Provincial government</p> <p>Alliance of governments, organizations and industry to request an exemption.</p>

Goal 4: Support Incentives for Change



RECOMMENDATIONS	ACTIONS	LEADERSHIP
<ul style="list-style-type: none"> Introduce federal and provincial tax credits for heritage conservation as well as reuse of commercial and industrial buildings. 	<ul style="list-style-type: none"> Include heritage tax credits starting with the 2011 federal budget. Research provincial tax incentives and credits for heritage conservation in BC. 	Federal government and Heritage Canada Foundation
<ul style="list-style-type: none"> Deliver federal and provincial grants for green rehabilitation capital projects, including seismic upgrades. 	<ul style="list-style-type: none"> Earmark funding for green rehabilitation for 2010. 	Federal and provincial governments
<ul style="list-style-type: none"> Implement municipal property tax incentives for heritage conservation. 	<ul style="list-style-type: none"> Analyze the economic benefits of reinvestment in heritage in property tax projections. Set up a legal and regulatory process for approvals. 	Local governments Local governments

Goal 5: Building Partnerships



Photo credit Heritage Branch, Province of British Columbia

RECOMMENDATIONS	ACTIONS	LEADERSHIP
<ul style="list-style-type: none"> Exchange information and expand cooperation between policymakers for economy, environment, energy, heritage, municipal planning and building standards. 	<ul style="list-style-type: none"> Review Public Works and Government Services Canada’s Sustainable Heritage Rating System and Parks Canada’s new Standards and Guidelines to inform green rehabilitation policy. Build and sustain inter-Ministry partnerships to connect and coordinate initiatives. Help municipalities to achieve goals through financial support, education and R & D. 	<p>Canada Green Building Council Policymakers</p> <p>Federal and provincial governments</p> <p>Federal and provincial governments, education sector and industry.</p>
<ul style="list-style-type: none"> Support the construction industry in green rehabilitation. 	<ul style="list-style-type: none"> Develop a culture among building officials to use alternate code compliances for heritage. Connect LEED Canada clients with information on the Standards and Guidelines. 	<p>Municipalities and trades organizations.</p> <p>Canada Green Building Council</p> <p>Parks Canada</p>
<ul style="list-style-type: none"> Forge alliances with organizations across the sectors of construction, environment, energy, heritage and community 	<ul style="list-style-type: none"> Partner with sustainable planning movements Smart Growth and Congress for the New Urbanism. 	<p>Provincial and municipal governments</p> <p>Heritage organizations</p>

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planning, and with governments.	<ul style="list-style-type: none">• Partner to educate for change, facilitate projects and R&D.	Government and non-government sectors
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Goal 6: Further Research and Development



RECOMMENDATIONS	ACTIONS	LEADERSHIP
<ul style="list-style-type: none"> Establish a Canada-wide research program on the Life Cycle Assessment of Historic and Existing Buildings. 	<ul style="list-style-type: none"> Compare the cradle-to-grave impacts of new construction and demolition to retaining buildings, including embodied energy. 	<p>Government, organizations, industry and universities</p>
<ul style="list-style-type: none"> Conduct further energy upgrade modeling of historic buildings. 	<ul style="list-style-type: none"> Assess efficiencies of retrofits to heritage, existing and older buildings. Model the efficiency of energy-conserving historic assemblies. Undertake demonstration projects on how to upgrade while retaining heritage character. 	<p>Government, organizations, industry and universities</p> <p>Government, organizations, industry and universities</p> <p>Government, organizations, industry and universities</p>
<ul style="list-style-type: none"> Link research to policy development. 	<ul style="list-style-type: none"> Share outputs with policy-makers. 	<p>Government and organizations</p>

Goal 7: Develop Best Practices



RECOMMENDATIONS	ACTIONS	LEADERSHIP
<ul style="list-style-type: none"> Develop a standardized approach to projects that brings together a team of building and heritage professionals and integrates the separate models for sustainable design and sensitive heritage conservation. 	<ul style="list-style-type: none"> Incorporate the concepts of heritage value and character-defining elements, and the principle of minimal intervention into LEED Canada design approaches and strategies. Add a step in the Parks Canada decision-making model to consider LEED strategies in heritage projects. Develop an integrated model for decisions on approaches and strategies in green rehabilitation. 	<p>Canada Green Building Council</p> <p>Parks Canada</p> <p>Canada Green Building Council, Parks Canada, building and heritage professionals</p>
<ul style="list-style-type: none"> Make it best practice in the integrated design process to consider the strategies, synergies and tradeoffs which can earn LEED Canada credits, and meet the Standards and Guidelines for heritage rehabilitation. 	<ul style="list-style-type: none"> Review case studies and define a set of integrated considerations. 	<p>Canada Green Building Council</p>
<ul style="list-style-type: none"> Assess and balance the environmental, economic and social impacts of heritage projects. 	<ul style="list-style-type: none"> Consider ways to integrate social impact assessment in LEED, learning from initiatives such as the UNEP's Life Cycle Initiative. 	<p>Canada Green Building Council</p>

Goal 8: Raise Awareness



Photo credit Heritage Branch, Province of British Columbia

RECOMMENDATIONS	ACTIONS	LEADERSHIP
<ul style="list-style-type: none"> Raise the national profile of initiatives to gather and expand public and private support. 	<ul style="list-style-type: none"> Draw attention to the U.S. federal tax credits for historic and environmental conservation, and the economic and social benefits. 	<p>Canada Green Building Council, Parks Canada, provincial heritage programs, local governments, heritage organizations and professionals</p>
<ul style="list-style-type: none"> Inform and educate about a life cycle economy and the impact of construction on the environment. 	<ul style="list-style-type: none"> Web-based education and publications. Media releases and stories. Professional development courses. 	<p>Government and organizations</p> <p>Government and organizations</p> <p>Government and organizations</p>
<ul style="list-style-type: none"> Exchange experiences, advice and expertise between building and heritage professionals. 	<ul style="list-style-type: none"> Launch list-serves, web-forums or portals, searchable databases. 	<p>Government, organizations, and industry</p>

CONCLUSIONS: THE WAY FORWARD

Green rehabilitation is an opportunity to respond to climate change through the transformation of the built environment, but projects are faced with challenges. There are disconnects between policies, legislation, systems and standards for green buildings, building codes and heritage conservation in Canada. Also, capital costs may be higher than new construction particularly if seismic upgrades are required.

Further cooperation between policymakers, building and heritage professionals and organizations is needed to remove barriers, support incentives for change and raise awareness about the impact of heritage and building conservation in climate action. The way forward is through a coordinated effort that involves the Cascadia Region Green Building Council (“Cascadia”) in conjunction with the Canada Green Building Council, Parks Canada, and all levels of government.

Cascadia and the Canada Green Building Council can:

- Educate and network for change and promote retrofits and reuse.
 - Draw attention to the U.S. federal tax credits for historic and environmental conservation, and the economic and social benefits.
 - Offer web-based education and publications as well as e-mail list-serves and online databases.
 - Send media releases and approach outlets for stories.
 - Deliver professional development courses.
- Identify a path for acceleration and track numbers of registered and certified existing building LEED Canada-NC and LEED Canada-EBOM projects from 2010-15.
- Co-develop an integrated design model for green rehabilitation that integrates the approaches in LEED Canada and the Standards and Guidelines. .
- Incorporate the concepts of heritage value and character-defining elements, and the principle of minimal intervention into LEED Canada.
- Connect clients with information on the Standards and Guidelines.
- Consider ways to integrate social impact assessment in LEED Canada credits, learning from initiatives such as the United Nations Environment Programme’s (UNEP) Life Cycle Initiative¹⁸.
- Award points for the durability and energy-conservation features of historic buildings and assemblies.
- Reward rehabilitation projects in green building rating and standard systems for reductions in construction-related CO2 emissions compared to new construction.
- Identify potential conflicts in LEED Canada-NC and LEED Canada-EBOM credits and the Standards and Guidelines.
- Discourage the strategy of retaining heritage facades (*facadism*) that conflicts with heritage principles.

18 <http://lcinitiative.unep.fr/>

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- Undertake demonstration projects on how to upgrade while retaining heritage value and character-defining elements.
- Profile recent and past exemplary projects through detailed case studies.

Figure 6: Working Together Around the Table



BC Heritage can:

- Build and sustain inter-Ministry partnerships to connect and coordinate initiatives.
- When funding permits, assist municipalities through financial support, education and nationwide research.
- Partner with the following to develop tools, programs and knowledge to further the role of green rehabilitation as an effective climate action:
 - green building and sustainable development non-governmental organizations such as Cascadia Region Green Building Council, City Green, Smart Growth, and Congress for the New Urbanism;
 - professional associations such as the Architectural Institute of BC, the BC Society of Landscape Architects, the Planning Institute of BC and others;
 - sustainable planning and development movements such as the Gaining Ground Conference
- Educate and network for change and promote retrofits and reuse.

- Draw attention to the U.S. federal tax credits for historic and environmental conservation, and the economic and social benefits.
- Connect heritage audiences with information on LEED Canada.
- Enhance web-based education and publications.
- Facilitate development of media releases and stories.
- Provide professional development courses.
- Facilitate and support the development of list-serves, web-forums, portals and online databases.
- Co-develop an integrated green building and heritage conservation decision-making for design approaches and strategies in green rehabilitation.
- Add a step in the conservation planning decision-making model for heritage conservation to consider green building strategies, among other external factors that impact heritage value, in the method of intervention.
- Identify conflicts between the Standards and Guidelines for the Conservation of Historic Places in Canada and LEED Canada-NC and LEED Canada-EBOM.
- Suggest changes to the Standards and Guidelines for the Conservation of Historic Places in Canada that encourage greener practices for heritage conservation projects.
- Work with CAGBC to include heritage-related credit language as they develop new rating systems.
- Undertake further research and development to:
 - Compare the cradle-to-grave impacts of new construction and demolition to retaining buildings, including avoided impacts.
 - Assess efficiencies of retrofits to heritage, existing and older buildings.
 - Model the efficiency of energy-conserving historic assemblies.
 - Demonstrate how to upgrade while retaining heritage character.
 - Research tax and incentives options that could be implemented by the provincial government that would encourage the green rehabilitation of existing and heritage buildings.
- Exempt heritage buildings from the BC Homeowner Protection Act requirements for home warranties, or change the law to enable the in-situ building assemblies to meet alternative standards to the laboratory-approved level of performance for new homes.
- Introduce equivalencies for heritage buildings where character-defining features will be altered, damaged or removed to meet green code requirements.
- Integrate recognition of the efficiency of repairing sash windows with storms, over replacement with new as well as other repair over replacement strategies for energy upgrading into EnerGuide and energy assessment audits.
- Develop a culture among building officials of using alternate code compliances for heritage buildings.

Local governments can:

- Network for change, including a heritage exemption in the BC Homeowners Protection Act, and promote retrofits and reuse in communities.
- Implement municipal property tax breaks and other financial incentives for heritage conservation.
- Provide property owners and developers with information on federal tax credits for residential, commercial and industrial EnerGuide upgrades and renovations.
- Develop a municipal culture of using alternative building code compliances for heritage buildings to enable green rehabilitation projects to go forward.
- Plan sustainable communities with population and economic growth in historic and older neighbourhoods.

Provincial and territorial governments can also:

- Build and sustain inter-Ministry and Federal-Provincial department partnerships to connect and coordinate initiatives.
 - Exchange information and expand cooperation between policymakers for economy, environment, energy, heritage, municipal planning and building standards.
 - Help municipalities to achieve goals through financial support, education and research.
- Earmark funding for green rehabilitation for 2011-12.
- Support Main Street programs.

The **Federal Government** can :

- Build and sustain inter-Ministry and Federal-Provincial department partnerships to connect and coordinate initiatives.
 - Exchange information and expand cooperation between policymakers for economy, environment, energy, heritage, municipal planning and building standards.
 - Review Public Works and Government Services Canada's Sustainable Heritage Rating System and Parks Canada's new Standards and Guidelines to inform green building policy.
 - Help municipalities to achieve goals through financial support, education and research.
- Earmark funding for green rehabilitation for 2011-12.
- Include heritage tax credits in the 2011 federal budget.
- Support Main Street programs.

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- Establish a Canada-wide construction sector research initiative on the life cycle management of historic, existing and older buildings.
- Partner with the Canada Green Building Council as well as professional associations such as the Royal Architectural Institute of Canada, the Canadian Society of Landscape Architects, the Canadian Institute of Planners and others.



Please contact the Cascadia Region Green Building Council for more information:

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