

Build Better Buildings

A Sustainable Buildings Policy for
Government of Newfoundland and Labrador
Funded Projects



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1.0 Vision and Purpose

In the Provincial Government's 2007 Energy Plan, *Focusing Our Energy*, the link between the development of the province's energy resources and the protection of the environment was established. The Provincial Government committed to developing the province's energy resources in an environmentally sustainable manner.

Focusing Our Energy outlined the Provincial Government's vision of a Newfoundland and Labrador that is a highly efficient consumer, as well as a net producer of clean energy. This vision not only requires the responsible and environmentally-conscious development of the province's renewable resources such as the Lower Churchill project, it also requires the creation of a culture of efficiency and conservation.

In efforts to realize this vision, the Provincial Government has introduced a number of programs and continues to work closely with its peers throughout North America on initiatives that support energy efficiency and conservation, as well as reducing the negative impact of climate change on the province.

This Build Better Buildings (BBB) Policy will establish the parameters under which provincially funded projects are built in the future.

1.1 The Case for Building Green

Although buildings may not immediately come to mind when thinking about energy consumption and harmful emissions, they are actually significant contributors to both. In fact, the Canada Green Building Council (CaGBC) estimates that in Canada, buildings account for approximately 33 per cent of all energy used and in this province, the Office of Climate Change, Energy Efficiency and Emissions Trading estimates that buildings account for almost 25 per cent of GHG emissions.¹



Glacier Arena expansion and Pearlgate Recreation Multiplex, Mount Pearl

The Provincial Government is an important player with respect to the provincial building stock. It currently manages and maintains over 600,000 square metres of floor space at over 380 sites across the province and is engaged in a significant number of construction and renovation projects with a total multi-year construction value of close to \$1 billion. The Provincial Government contributed close to \$190.5 million in 2010/11 in major funding partnerships in the construction of new buildings and management of other capital projects for Provincial Government departments and Provincial Government-funded bodies in local communities.

¹ The definition of buildings used in this instance includes residential buildings.

Given its significant role in developing and maintaining the provincial building stock, the Provincial Government has an interest in ensuring its buildings are built to high energy and environmental standards.

Improved Indoor Environment

The quality of the indoor environment of buildings has an effect on an individual's daily life. Outdated heating systems, poor ventilation systems, and inadequate lighting are just some building features that can impact its occupants. Improving the indoor environment of buildings has been shown to have positive benefits to occupants such as: improved health, increased happiness, improved productivity, lower absenteeism rates, improvements in employee recruitment and retention, and improved learning.

Environmental Benefits

The electricity required to power large buildings is significant and it is therefore not surprising that buildings account for a significant proportion of harmful emissions released into the environment. As mentioned, estimated emissions from buildings in this province account for almost one-quarter of all harmful emissions on a yearly basis. Reducing the energy consumption of buildings will consequently reduce the level of harmful GHG emissions into the atmosphere and contribute to a cleaner, healthier environment for the people of the province.

Sustainable building practices will also conserve the province's valuable energy resources. Not only will energy consumption be lower, the amount of water used will be reduced through the use of building components such as low-flow faucets.

Building practices that focus on sustainability also reduce the amount of construction waste and encourage recycling of building materials, thereby easing the strain on landfills.



Improved Economics

Traditionally, more energy means more money. In other words, the more energy that a building consumes, the more expensive the operating and maintenance expenses become. A building with poor insulation and/or inefficient heating, lighting and ventilation systems is very costly to both operate and maintain.

Build Better Buildings

Over the past several years, there have been significant advances in energy efficient technologies and building components. While many of these components have initial cost premiums, their utilization can effectively reduce operating and maintenance costs and consequently offset initial premiums. In addition, reducing domestic energy consumption can lead to long-term benefits for the province. In effect, less energy consumed domestically equals more energy available for export.

Moreover, buildings that are built in a sustainable manner have proven to retain their value over longer periods of time than conventionally-built buildings.

Paradise II School

In 2007, the Provincial Government announced that two new schools would be built in Paradise. This significant investment came as a result of the community's growing population and its need for new, healthy educational institutes. Paradise II School is a \$12.7 million two storey structure that is located in Elizabeth Park. The building includes administrative spaces, classrooms, a gymnasium, student and staff lunch rooms, a modern learning resource centre, and a challenging needs suite. The school has been designed to exceed the energy efficiency standards of the Model National Energy Code for Buildings (MNECB) as well as achieve a LEED Silver Rating.

Key features of the building include:

- Low-flow faucets (3.6L/min) and showers (6L/min);
- Lighting power density of 8.1W/m² and "no occupancy" sensors throughout classrooms and administrative spaces;
- Heating, ventilating and air conditioning (HVAC) system using a vertical borehole earth energy based system sized for 50 per cent of the peak heating capacity.

Anticipated Annual Reduction in Energy Use: **61.8%**
Anticipated Annual Energy Cost Savings (%): **59.6%**
Anticipated Annual Energy Cost Savings (\$): **\$101,404**



1.2 Build Better Buildings

The Provincial Government recognizes the importance of energy efficiency and conservation, improving the indoor work environment for the benefit of all occupants, and reducing harmful emissions associated with buildings.

In *Focusing Our Energy*, the Provincial Government committed to lead by example and implement a policy whereby buildings that were built or funded by the Provincial Government would meet energy efficient standards relating to the Model National Energy Code of Canada and the Leadership in Energy and Environmental Design (LEED) Program.

Build Better Buildings (BBB) is that policy.

All buildings that fall under this policy will be built to energy and environmentally efficient standards that will:

- improve the indoor environment for the benefit of occupants;
- reduce harmful emissions;
- conserve valuable energy resources by consuming less energy;
- reduce operating and maintenance costs over the life-cycle of the building, and;
- emphasize environmentally-friendly building practices

Buildings have a significant impact, not only on outdoor and indoor environments, but on the health and well-being of individuals. BBB represents a major step towards the vision of a modern, healthy, clean, and efficient province.

2.0 Scope

2.1 Buildings covered by BBB

BBB applies to all new buildings and major renovations and/or extensions to existing buildings receiving *any level* of capital construction funding from the Provincial Government or built by Provincial Government corporations or agencies where:

- The area of a new building or extension to an existing building is 600 sq. m. (6,458 sq. ft.) or more; or
- The cost of renovations and/or extensions to an existing building (600 sq. m. or more) exceeds 50 per cent of the cost of a new building of equivalent size and function.



Laval High School (Placentia)

Building projects receiving funding from the Provincial Government or built by Provincial Government corporations or agencies that do not fall within the scope of BBB are expected to adhere to BBB to the greatest extent practical.

2.2 Organizations covered by BBB

BBB applies to all Provincial Government of Newfoundland and Labrador departments, agencies, crown corporations and all other entities that are provincially funded or receive any level of provincial capital construction funding for a building construction, extension, or renovation project as outlined in Section 2.1.

2.3 Effective Date

Projects that have received or have been approved for provincial funding prior to the release of this policy are expected to adhere to BBB to the greatest extent practical.

3.0 Requirements

3.1 Exceed the Model National Energy Code of Canada for Buildings (1997) by 25 per cent²

Projects within the scope of BBB must exceed the 1997 Model National Energy Code of Canada for Buildings (MNECB) by 25 per cent.



The Model National Energy Code of Canada for Buildings (MNECB) was introduced by the National Research Council in 1997 to establish construction standards for building components and features that affect energy efficiency in buildings. The MNECB takes a number of regional differences into account including construction costs, climate, and fuel types and costs.

Exceeding the MNECB by 25 per cent typically requires improved insulation in walls and roofs, improved efficiency in windows, lighting, and HVAC systems, and improved heat recovery. For more information on achieving this requirement, please refer to:

Model National Energy Code of Canada for Buildings 1997

http://www.nationalcodes.ca/mnecb/index_e.shtml

3.2 Achieve a minimum Silver Standard in the Leadership in Energy and Environmental Design Program (LEED)

Where practical³, projects within the scope of BBB must register with LEED Canada and strive to achieve a minimum of LEED Silver certification under the appropriate LEED rating system.⁴

LEED is administered in Canada through the Canada Green Building Council (CaGBC) and is a market-based rating system that provides third-party verification of green buildings. LEED has become the most recognized green building rating system in North America with thousands of projects registered with, and certified through the program.

The LEED Program places an emphasis on sustainable building and development practices with points awarded in key energy and environmental categories:

- 2 In 2007, the Canadian Commission on Building and Fire Codes (CCBFC) established a Standing Committee to update the technical provisions of the 1997 version of the MNECB. The updated MNECB is anticipated to be released in 2011 and will update technical provisions with a view to increase energy efficiency. Once released, the new MNECB will be reviewed and BBB may be amended accordingly.
- 3 See Section 4.2.
- 4 The CaGBC is consistently updating the LEED program and its rating systems to better represent various building types, regional differences, and changing innovations and technologies.

- 1) Sustainable site development
- 2) Water efficiency
- 3) Energy and atmosphere
- 4) Materials and resource selection
- 5) Indoor environmental quality
- 6) Innovation in design
- 7) Regional priority



LEED promotes a whole-building approach to sustainability by recognizing performance at every stage of the building process. Points are awarded through the completion of credits which range from energy efficient building components and the use of renewable sources of energy to waste reduction, water conservation, and the recycling of building materials. LEED uses a scientific approach to determine the points earned for each credit, and in doing so the program places an emphasis on preventing climate change. As part of meeting this requirement, proponents are encouraged to collaborate with all stakeholders associated with, and affected by the project.

For more information on the LEED program, please refer to:

LEED Canada Initiative

http://www.cagbc.org/initiatives/leed_canada/index.php

3.3 Complete a life-cycle project cost analysis

In order to better understand the building's performance and associated cost savings, all projects within the scope of BBB must complete a life-cycle project cost analysis. It is expected that any additional capital costs required to adhere to BBB will be more than offset by the cost savings associated with improved performance of the building(s).

Completing a life-cycle cost analysis will also allow the Provincial Government to monitor the impact of BBB. Life-cycle costing should be based on reasonable forecasts and assumptions prevailing at the time of the analysis for such items as discount rate, annual escalation rate for electricity, annual escalation rate for other fuel costs, and annual escalation rate for other building operation costs. The prevailing forecasts and assumptions accepted by the Province will be provided to proponents as needed for completion of the life-cycle cost analysis.

4.0 Administration

4.1 BBB Assessment Committee

The BBB Assessment Committee will be a standing committee comprised of representatives from a number of Provincial Government departments including (but not limited to): Natural Resources, Environment and Conservation, Transportation and Works, Municipal Affairs, Government Services, Education, Health and Community Services, and the Office of Climate Change, Energy Efficiency, and Emissions Trading.

Corner Brook Long-Term Care Facility

On October 26, 2005 the Provincial Government turned the sod on the site of the Corner Brook Long-Term Care Facility. Not only has the building been designed to meet the Provincial Government's commitment to enhancing the long-term care and accommodations for seniors in the region, it has also been designed to meet energy efficient standards in its day to day functions.



The long-term care facility has been designed to meet and exceed the standards of the Model National Energy Code for Buildings (MNECB) and to receive a sufficient amount of points under the LEED program.

Key features of the building include:

- Energy efficient lighting such as fluorescent lamps with electronic ballasts, and lighting controls with occupancy and daylight sensors;
- Heating from a ground source heat pump system comprised of multiple centralized water-to-water and water-to-air heat pumps connected to a vertical ground heat exchange;
- HVAC systems comprising high efficiency fans modeled with an increased pressure drop to account for the added resistance associated with the heat recovery;
- Efficient water consumption through low-flow fixtures such as faucets with a flow of 1.9Lpm, and showers with a flow of 5.7Lpm.

Anticipated Annual Reduction in Energy Use:	52.5%
Anticipated Annual Energy Cost Savings (%):	55.6%
Anticipated Annual Energy Cost Savings (\$):	\$269,000

The principal duties of the BBB Assessment Team are to:

- Receive, assess and interpret appeals for exemptions
- Make decisions on appeals for exemptions
- Monitor and report on the impacts of BBB
- Make recommendations on amendments to BBB if /when necessary

Throughout the implementation of BBB, the duties and composition of the BBB Assessment Committee may change.

4.2 Appeals

There may be instances where a proponent may feel as though there are legitimate reasons why a project should not be bound by this policy, despite falling within the scope of BBB as described in Section 2. In such cases, the proponent must clearly articulate these reasons in writing to the BBB Assessment Committee.

All appeals for exemptions must be sent in writing to:

Build Better Buildings Assessment Committee
c/o Assistant Deputy Minister, Energy Policy
Natural Resources Building
50 Elizabeth Avenue
P/O Box 8700
St. John's, NL
A1B 4J6

The BBB Assessment Committee will assess the appeal documentation and make a decision on whether an exemption will be granted.

5.0 Conclusion

From the quality of indoor environments to the contributions to climate change, the effect of buildings on an individual's daily life cannot be underestimated. Through BBB, the Provincial Government is leading by example and ensuring that provincially-funded buildings consume less energy, are more cost-effective, boast improved indoor environments, and are more environmentally friendly than ever before.

BBB represents a progressive and proactive step towards creating a culture of efficiency and conservation for the benefit of the people of this province and the Provincial Government is genuinely committed to responsibly developing the province's resources in an environmentally-sustainable manner.



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