

Manitoba Green Building Policy Implementation Guide

Version 1.0

Prepared by:
Manitoba Green Building Coordination Team

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The Green Building Coordination Team invites feedback from users of this document. This feedback will help ensure that future versions of the Guide respond to the need for more or different information, as it continues to help stakeholders interpret Manitoba's Green Building Policy.

Please forward your comments to the GBCT in writing via mail, email, or by fax to:

Manitoba Green Building Coordination Team
Web: manitoba.ca/greenbuilding
Email: greenbuilding@gov.mb.ca
Tel: 1-866-626-4862

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Introduction

This Implementation Guide is a supplement to the *Green Building Policy for Government of Manitoba Funded Projects* dated April 1, 2007 (Green Building Policy). The Guide is intended to assist stakeholders to interpret and apply the Green Building Policy.

The Guide was prepared by the Green Building Coordination Team (GBCT), under the direction of the Manitoba Green Building Policy Interdepartmental Working Group (IWG). The IWG is co-chaired by Manitoba Science, Technology, Energy and Mines, and Manitoba Finance. The policy work of the IWG is approved by Treasury Board.

This Guide is an important component of the Government of Manitoba's Green Building Program, which is the implementation strategy for the Policy. The main purposes of the Guide are to:

- clarify the intent of key sections of the Green Building Policy;
- provide the rationale for certain Policy requirements, and;
- share potential techniques and strategies that will help stakeholders comply with the Policy.

This Guide quotes parts of the Green Building Policy, but is not a substitute for the Policy itself. To ensure you are working with the most current version of the Policy, please visit manitoba.ca/greenbuilding to download a copy.

The GBCT has produced this Guide in response to the feedback it received from stakeholders during the consultation period for the draft Green Building Policy. The complete Stakeholder Consultation Report is available at manitoba.ca/greenbuilding.

Green Building Policy Overview

The Green Building Policy has been introduced to foster a significant improvement in the energy performance and environmental sustainability of provincially-funded building projects in Manitoba.

The Policy applies to non-residential provincial government new construction and major renovation projects with a building area of 600 sq. m (6500 sq. ft.) or more, and non-government projects that are wholly or partly funded by a provincial department, Crown corporation or agency. For the purposes of the Policy, major renovation projects are deemed to be those that exceed 50% of the cost of a new building of equivalent size and function.

With limited exceptions, projects that fall within the scope of the Policy must achieve a minimum of Silver certification under Leadership in Energy and Environmental Design (LEED®), the Canada Green Building Council's rating system for the design, construction, and operation of high performance green buildings. The LEED® system assigns points to projects that implement certain environmental and energy-efficient measures, and has four levels of certification.

As well, projects covered by the Policy must use an Integrated Design Process (IDP), a design approach that calls for all stakeholders involved in the project to work together, from the outset, in a holistic, collaborative and comprehensive approach.

The Policy applies to projects that receive funding approval after April 1, 2007. The Policy does not apply, unless otherwise mandated by Treasury Board, to projects funded prior to April 1, 2007 and in the midst of design or construction on April 1, 2007.

Certain exemptions to the Policy may apply in special cases. For a project to be exempt or subject to reduced requirements, the proponent should seek an opinion from the Green Building Coordination Team. The reasons why compliance with the Policy is either not cost-effective or impractical should be documented in writing. The proponent should also indicate what, if any, measures they propose to take towards meeting the intent of the Policy to improve energy performance and environmental sustainability.

1. Policy Vision, Purpose and Goals

This section refers to items in Section 1 of the Policy, which outline the overall vision, general purpose and specific goals of how new and renovated buildings funded by the Government of Manitoba are to perform over their life cycle from an environmental, energy and economic perspective.

1.1 Reduce Exposure to Fossil Fuels

A major goal of the Policy is to “Reduce Manitoba’s exposure to the price volatility and long-term supply concerns associated with the use of non-renewable fossil fuels imported from outside the province (i.e. natural gas, fuel oil, and propane).”

Rationale

Historically, natural gas has been the lowest cost energy source in Manitoba. As a result, the majority of buildings in Manitoba use natural gas for space and water heating since they’re mostly located in major centres in the southern part of the province that are served by the natural gas distribution network.

In recent years, the cost of natural gas has been very volatile. At certain times, it has even exceeded the cost of electricity in Manitoba. Although short-term natural gas prices are difficult to predict with certainty, there is agreement amongst most forecasters that future natural gas prices will, on average, be much higher than in the past (see Figure 1 for example). Similar concerns also exist for fuel oil and propane since the prices of these fossil fuels are influenced by natural gas prices.

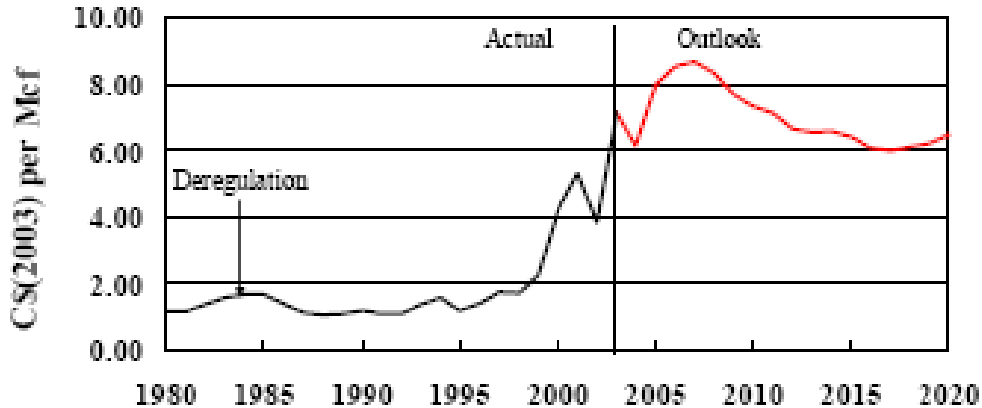


Figure 1: Natural Gas Price (Alberta wellhead)

(Source: Natural Resources Canada, *Canada’s Energy Outlook: The Reference Case 2006*)

There is also a growing concern that although natural gas production in Canada has risen in recent years, it is now near a peak and will begin to decline within the next several years (see Figure 2). This will mean that Canada (and potentially Manitoba) will become increasingly dependant on imported natural gas supplies. This raises long-term concerns about security of supply since the majority of the world's natural gas exports come from a small number of countries and regions (i.e. Russia, Iran, Qatar) that are considered either unreliable or subject to considerable political risk.

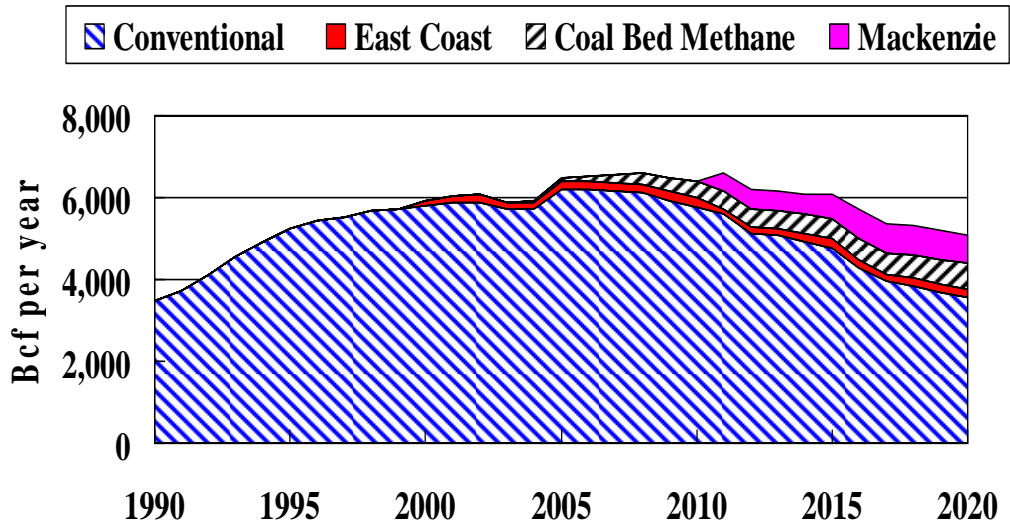


Figure 2: Canada's Natural Gas Production

(Source: Natural Resources Canada, Canada's Energy Outlook: The Reference Case 2006)

The publicly-funded building projects that we undertake today in Manitoba will face an uncertain energy future. As a result of concerns about the future cost and security of supply for natural gas and other fossil fuels, not to mention that these energy sources are also a major source of greenhouse gas emissions and other emissions that negatively impact local air quality, the Green Building Policy encourages using Manitoba's abundant sources of relatively clean renewable energy (especially electricity).

2. Policy Background

This section refers to items in Section 2 of the Policy, which lists the benefits of green buildings and provides context of why the Policy has been developed.

2.1 Environmental Impacts of Buildings

The Green Building Policy states: “The buildings sector is a significant contributor to depletion of natural resources and is a major cause of greenhouse gas emissions, air and water pollution, solid waste, deforestation, toxic waste, and health hazards, and other negative consequences.”

Clarification

According to *Canada’s Energy Use Data Handbook 2005* published by Natural Resources Canada, Canada buildings and houses sector account for¹:

- 31% of total secondary energy use; and
- 30% of total greenhouse gas emissions (including electricity-related emissions).

According to *Why Build Green?* by the U.S. Green Building Council, buildings and houses in the United States account for²:

- 36% of total energy use and 65% of electricity consumption;
- 30% of greenhouse gas emissions;
- 30% of raw materials use;
- 30% of waste output (136 million tons annually); and
- 12% of potable water consumption.

Rationale

Since the Canada and U.S. construction markets are similar, and their energy and greenhouse gas emission figures are similar, U.S. data about environmental impacts due to raw material use, waste output, and potable water consumption are considered applicable to Canada.

¹ Natural Resources Canada. (2005). Energy use data handbook, 1990 and 1998

To 2004. http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/handbook05/datahandbook2005.pdf.

² U.S. Green Building Council. (2007a). Why build green?

<http://www.usgbc.org/DisplayPage.aspx?CMSPageID=291&>.

3. Projects Covered by This Policy

This section refers to items in Sections 3.1 of the Policy, which describes the scope of the Policy and types of building projects it affects.

3.1 Building Area

The policy document uses the term “building area” when describing the size of projects to which the Policy applies.

The Policy applies to “...all new buildings and additions to existing buildings with a building area of 600 sq. m. (6458 sq. ft.) or more...”

Clarification

The *Manitoba Building Code* is based on the *National Building Code of Canada (NBCC)*. The 2005 NBCC defines building area as follows:

“Building area means the greatest horizontal area of a building above grade within the outside surface of exterior walls or within the outside surface of exterior walls and the centre line of firewalls.”

Rationale

The threshold of 600 sq. m. was chosen as the size threshold in order to restrict the application of the Policy to Part 3 buildings and larger Part 9 buildings, as defined in the *National Building Code of Canada*.

3.2 Major Renovations

The Policy applies to major renovations of existing buildings “...where the economics of new construction apply.”

Clarification

To ensure that the Policy is applied in a consistent manner to major renovation projects, it defines what is meant by the “economics of new construction” (i.e. “The ‘economics of new construction’ refers to major renovation projects where the estimated renovation costs exceed 50% of the cost of a new building of equivalent size and function.”)

The Policy also establishes the expectation that even when renovation projects do not reach this threshold, that reasonable efforts will still be undertaken to meet the design, environmental and energy requirements of Section 4 of the Policy where feasible (i.e. “Where renovation costs are less than 50%, and major building components or systems are to be replaced for reasons not related to environmental or energy performance, the requirements in Section 4 are not mandatory but should be followed to the greatest extent practical.”)

Rationale

The renovation of a building presents an excellent opportunity to incorporate measures to improve energy efficiency and environmental performance. This Policy requirement

recognizes that a significant portion of capital support for construction that is provided by the Government of Manitoba is expended on the renovation of existing buildings.

Potential Strategies

If the estimated renovation costs of a project are less than 50% of the cost of a new building of equivalent size and function, the proponent should provide the Green Building Coordination Team with a brief letter describing the project and why it should be exempt from the Policy. This letter can be forward electronically to the Team at greenbuilding@gov.mb.ca.

As a guide, it is suggested that this documentation include the following elements:

1. Name (if applicable) and street address of the existing building.
2. Name of the owner of the existing building.
3. Brief description of the building type and function.
4. Total building area (as defined in the National Building Code of Canada) of the existing building;
5. Approximate total gross cost per square foot (as identified by Hanscomb's Yardsticks for Costing³ or equivalent guide) for a new building of similar primary type and function.
6. Estimated total gross renovation costs.
7. Total gross estimated renovation costs as a percentage of the cost of a new building of equivalent size and function (as calculated according to 3, 4, and 5 above);
8. A statement that the percentage is less than 50% of the cost of a new building of equivalent size and function, thus exempting the existing building referred to in the letter from the Green Building Policy for Government of Manitoba Funded Projects; and
9. A statement that the information provided in the letter is true and accurate, and that supporting documentation is available upon request.

It is recommended that the proponent keep this documentation on file for a reasonable period of time after the renovation is completed.

For information about energy efficiency incentives for the retrofit of existing buildings see the following links:

- Manitoba Hydro Power Smart Commercial Programs
http://www.hydro.mb.ca/your_business/savings_commercial.shtml
- Natural Resources Canada's ecoENERGY Retrofit Incentive for Buildings
<http://oee.nrcan.gc.ca/commercial/financial-assistance/existing/retrofits/index.cfm?attr=20>

⁶ Hanscomb's Yardsticks for Costing: <http://www.hanscomb.com/publications.htm>

3.3 Greatest Extent Practical

Section 3.1 of the Policy recommends that projects not mandated to comply with the Policy still follow its requirements “to the greatest extent that is practical.”

Clarification

In this context, “practical” is defined as strategies that are likely to be effective and feasible from a technical, economic, and environmental perspective. For example, for a building used mostly by people commuting from afar, it may be feasible but not effective to install bicycle storage and shower facilities.

Rationale

The proponents of projects not mandated to comply with the Policy can still show leadership in the area of sustainability by applying a more limited range of green building measures that make sense from a technical, economic, and environmental perspective.

Potential Strategies

To determine if a strategy follows the Policy to the greatest extent practical, it may be helpful to address the following questions. Is the strategy:

1. Technically appropriate for the building type and function?
2. Suitable for the building location?
3. Designed to meet the stated needs and desires of the building owner?
4. Aligned with the overall project goals and objectives?
5. Cost-effective (as determined by the willingness to pay and the payback threshold of the building owner) from a life-cycle costing perspective?
6. Environmentally sound?

3.4 Future Scope

Section 3.1 of the Policy states that it’s scope may expand in future versions and identifies four areas it may address in the future (a specific timeline for this expansion has not been established). These items are listed below along with a brief rationale for each one.

Item 1: *Reduce the environmental impacts from building operation, maintenance, repair and demolition or deconstruction*

Rationale

The cost and environmental impacts of buildings occur well beyond their initial construction. To achieve high levels of energy and environmental performance, there is a need to look beyond the initial building design and construction and establish a plan to operate and maintain the building efficiently to the end of its service life. Programs such as the Building Owners and Managers Association’s (BOMA) Go Green Program⁴ provide a benchmark of good practice and certification for building operation and maintenance.

⁴ BOMA Go Green Program: <http://www.bomagogreen.com>

Item 2: Include residential buildings (both single family and multi-family)

Rationale

In order for the Policy to have the greatest possible impact, it would need to also be extended to residential buildings. For now, single and multi-family buildings remain an item for future consideration since residential construction is already partially addressed by energy efficiency requirements in the Manitoba Building Code and by voluntary initiatives such the R-2000 Home Program and Manitoba Hydro Power Smart New Home Program.

A further consideration is that a green building rating system for residential construction is not yet offered in Manitoba. Currently, a program called Built Green is being used in Alberta and in certain locations in the United States, and the U.S. Green Building Council is piloting LEED® for Homes in 12 different communities across the U.S.

Item 3: Include leased accommodations

Rationale

The initial emphasis of the Green Building Policy is for the Government of Manitoba to “lead-by-example” in its own building and major renovation projects as well as those projects by others where it provides capital funding. However, the provincial government and its Crown corporations and agencies collectively are also a major leaseholder and the spaces they occupy have a significant environmental impact that needs to be eventually addressed.

To accomplish this, the provincial government will need to engage the commercial building development community and the commercial building real estate community to examine ways to make a leased accommodation a green building from the start, or how to retrofit a currently leased facility with green elements. As an important part of this initiative, the government and the building community will need to find a balance between the capital costs paid by the owner and the savings in operating costs, relative to normal levels, enjoyed by the tenant.

Item 4: Include a requirement for projects to offset greenhouse gas emissions through the purchase of ‘carbon credits’ or other actions where avoiding the use of non-renewable, carbon-based energy sources such as natural gas, fuel oil or propane is not feasible or not cost-effective

Rationale

Where the use of a carbon-based energy source cannot be avoided in building project, a requirement to purchase ‘carbon credits’ to offset the resulting greenhouse gas emissions will ensure that clean low or zero carbon renewable energy sources are not put at a competitive disadvantage. However, carbon credit trading is an item for future consideration since this concept is still being developed in Canada. Ideally, Manitoba’s implementation of a carbon offset system would be integrated with a national-level one, in terms of trading standards, costs, and other logistical considerations.

At this time, the first and only operational voluntary carbon trading system in North America is the Chicago Climate Exchange.⁵ The Canadian Climate Exchange was formed in 2003, but trading has not yet commenced.⁶

⁵ Chicago Climate Exchange: <http://www.chicagoclimatex.com/>

⁶ Canadian Climate Exchange: <http://www.canadianclimateexchange.com/>

4. Organizations Affected by this Policy

This section refers to items in Section 3.2 of the Policy.

The Policy applies to "...all Government of Manitoba Departments, Crown corporations and agencies as well as other entities that are either provincially funded or receive a direct capital contribution for a building or renovation project as described in Sub-section 3.1 with the exception of organizations receiving project funding solely from either Manitoba Hydro's Power Smart program⁷, or the Heritage Grants Program operated by the Historic Resources Branch of Manitoba Culture, Heritage and Tourism⁸."

Clarification

Primarily, the Policy applies to provincial government construction and major renovation projects that come under the mandatory criteria. That is, buildings being constructed where a provincial department, Crown corporation or agency is the client, and where those buildings are 600 sq. m. or greater in building area. The Policy extends to any non-Government-owned project that meets the size requirement that is funded in whole or in part by any provincial department, Crown corporation or agency.

For example, the Policy applies to the following broad project types (assume all examples meet the size threshold of 600 sq. m. or greater):

1. New hospital in Manitoba, or addition.
2. New correctional facility in rural Manitoba.
3. New public school in northern Manitoba.
4. Major renovation to an existing, provincial government-owned office building.
5. New community recreation centre in rural Manitoba which is funded partly through a Provincial program.

This list is only illustrative, and not meant to act as an exhaustive set of examples. The Green Building Coordination Team will provide an interpretation if any questions arise as to whether a particular project must comply with the Policy.

Rationale

Although Manitoba Hydro's Power Smart Program and the provincial government's Heritage Grants Program are a form of provincial funding, receiving funding from either program does not itself trigger the Policy, since these programs are designed to provide a small but worthwhile incentive to leverage much larger investments in energy efficiency or building conservation. The Green Building Policy is not intended as a disincentive to building owners, who might shy away from these other programs if they thought their projects would then fall under the Policy and trigger mandatory, large-scale environmental upgrades.

⁷ Power Smart Program: http://www.hydro.mb.ca/saving_with_ps/psmart_overview.shtml

⁸ Heritage Grants Program: <http://www.gov.mb.ca/chc/grants/hgp.html>

5. Effective Date

This section refers to items in Section 3.3 of the Policy.

The Policy states that compliance shall be voluntary for all projects that receive funding approval between April 1, 2006 and March 31, 2007, and compliance shall be mandatory after April 1, 2007 for all projects unless exempted under Sub-section 5.3. In this Guide, the exemptions are addressed in Section 12.

Clarification

The Policy applies to projects that receive funding approval after April 1, 2007. The Policy does not apply, unless otherwise mandated by Treasury Board, to projects funded prior to April 1, 2007 and in the midst of design or construction on April 1, 2007. For particular projects there may be an exception or a reduction in the requirements required under the Policy at the discretion of Treasury Board. Further clarification can be provided on a case-by-case basis by the Green Building Coordination Team. Where revised requirements are permitted, emphasis will be placed on cost-effective measures that have a direct positive impact on the building's performance with regards to energy and water efficiency.

Rationale

The effective date for the Policy to become mandatory was chosen early in the Policy development process. April 1, 2007 coincides with the start of the fiscal year, and represents the Government's desire to begin the transition in Manitoba to green building as soon as possible. For reasons of economic prudence, it is not feasible to retroactively apply new requirements, such as green building requirements, once the budget is set and work has begun on the design or construction of a building.

Potential Strategies

In order to effectively account for the Policy in their project, proponents should be keenly aware of their project's timeline and how it could be impacted by the Policy's transition and implementation dates. This will ensure that project proponents know as early as possible whether their project needs to comply with the Policy.

6. Integrated Design Process

This section refers to items in Section 4.1 of the Policy, which states that projects covered by the Policy are to use an Integrated Design Process (IDP).

Clarification

Under an Integrated Design Process (IDP), building design professionals take a holistic, collaborative approach to engage all stakeholders in the project at the very start to design the building as a team.

Rationale

Although many design methods and styles exist, the Manitoba government strategically chose the IDP as a requirement of projects that fall under the Green Building Policy. This decision was based on recent evidence showing that the design process itself is the most important contributor to the realization of cost-effective high performance buildings.

The IDP has impacts on the design team that differentiate it in several ways from a conventional design process: the client takes a more active role than usual; the architect becomes a leading team member rather than the sole provider of the building form; and the structural, mechanical and electrical engineers take on active roles at early design stages. The team's membership should include an energy specialist and, in many cases (particularly for larger projects), an independent design facilitator.

The IDP contains no elements that are radically new, but integrates well-proven approaches into a systematic total process. The skills and experience of mechanical and electrical engineers, and those of more specialized consultants, can be integrated at the concept design level from the very beginning of the design process. When carried out in a spirit of collaboration and co-operation among key actors, this process results in a design that is highly efficient with little, or in some cases, no incremental capital costs. It also results in reduced long-term operating and maintenance costs.

The benefits of the IDP are not limited to the improvement of environmental performance. Through its inherently open, inter-disciplinary discussion and synergistic approach, the IDP process has often led to improvements in the functional program, in the selection of structural systems, and in the architectural expression of the project.

The IDP is based on industry experience showing that changes and improvements in any design process are relatively easy to make at the beginning of the process, but become increasingly difficult and disruptive as the process unfolds. Although this seems like an obvious truism, few clients and designers seem to put this approach into practice. Moreover, the IDP process puts in place a defined roadmap that gives credence and form to the process, making it easier to promote and implement.

Potential Strategies

By familiarizing themselves with the IDP process, proponents will be well positioned to create high performance buildings at a reasonable cost. A key part of the process is identifying the essential stakeholders at the early stages of a project. These stakeholders may include:

- clients;

- design professionals;
- planners;
- contractors;
- tradespeople;
- building officials;
- future building occupants;
- building maintenance staff; and
- specialists in various aspects of building and/or environmental performance.

This list is not exhaustive, and may not include these precise stakeholders in every project. But identifying key stakeholders is an important step in the IDP process. After identifying the stakeholders, the proponents would turn their attention to the actual design process. Typical IDP elements include the following:

- Inter-disciplinary work between architects, engineers, costing specialists, operations people and other relevant actors right from the very beginning of the design process;
- Discussions on the relative importance of various performance issues and the establishment of a consensus on this matter between client and designers;
- Budget restrictions applied at the whole-building level, with no strict separation of budgets for individual building systems, such as HVAC or the building structure. This approach reflects experience showing that extra expenditures for one system (e.g. for sun shading devices) may reduce costs in another systems (e.g. capital and operating costs for a cooling system);
- The addition of a design facilitator to help shepherd the process and raise performance issues throughout and ensure specialists input as required;
- The addition of a specialist in the field of energy engineering and energy simulations;
- Testing of various design assumptions through the use of energy simulations throughout the process, to provide relatively objective information on this key aspect of performance;
- The addition of subject specialists (e.g. for daylighting, thermal storage, comfort, materials selection, etc.) for short consultations with the design team; and
- Clear articulation of performance targets and strategies, to be updated throughout the process by the design team.

As demonstrated in its application in Europe and elsewhere in North America, the IDP is characterized by a series of design loops, as opposed to a traditional, linear approach. In each of the design loops, the design team members relevant for that stage participate in the process, arriving at a decision called a milestone. Then the design process moves on to the next topic. The design process itself emphasizes the following broad sequence:

1. Establish performance targets for a broad range of parameters, and develop preliminary strategies to achieve these targets. In an integrated design team, this approach can bring engineering skills and perspectives to bear at the concept design stage, thereby helping the owner and architect avoid committing to a sub-optimal design solution.

2. Minimize heating and cooling loads and maximize daylighting potential through orientation, building configuration, an efficient building envelope, and careful consideration of the amount, type and location of fenestration (keeping in mind the requirements for building egress for emergency response).
3. Meet heating and cooling loads through the maximum use of solar and other renewable technologies and the use of efficient HVAC systems, while maintaining performance targets for indoor air quality, thermal comfort, illumination levels and quality, and noise control, and while meeting the objective of minimum building code requirements.
4. Iterate the process to produce at least two, and preferably three, concept design alternatives, using energy simulations to compare the success of each design, and then select the most promising design for further development.

7. Environmental Requirements

This section refers to Section 4.2 of the Policy, which describes the green building rating system that proponents must satisfy as part of meeting the requirements of the Policy.

7.1 Leadership in Energy & Environmental Design (LEED®)

The Green Building Policy requires that projects achieve a minimum of Silver certification using the Canada Green Building Council's *LEED Green Building Rating System for New Construction and Major Renovations: LEED® Canada-NC Version 1.0*.⁹

Clarification

LEED® is a comprehensive green building rating system. It requires building projects to meet a small number of prerequisites. The projects are then given points for achieving credits in some or all of five primary categories – Sustainable Sites, Water Efficiency, Energy & Atmosphere, Materials & Resources, and Indoor Environmental Quality, – by meeting specific performance criteria. There is a sixth category, Innovation and Design Process, that provides the potential of a point for an innovative measure. Based on the total number of points earned (for a maximum of 70 points), a project is certified by the Canada Green Building Council as Platinum (52-70 points), Gold (39-51 points), Silver (33-38 points), or Certified (26-32 points).

Rationale

Although other green building rating systems exist, the Manitoba government chose LEED® for three primary reasons. First, LEED® certification at any level requires independent, third-party verification by the Canada Green Building Council. This feature not only offers a level of independent recognition of the project, but also makes design teams aware of the need for ongoing project documentation. Second, LEED® has proven to be the primary green building rating system referenced in the majority of policies by other jurisdictions in North America that have chosen to adopt green building policies (e.g. Province of Alberta, Region of Waterloo, City of Calgary, City of Vancouver, etc.). Third, due to its increasing popularity of LEED®, Manitoba's building community has developed more knowledge and expertise about this green building rating system than any other.

Potential Strategies

1. Develop an Awareness of LEED® – Developing an awareness and understanding of LEED®, particularly with the various prerequisites and credits, will allow the design team to identify throughout the process which credits can be feasibly attained. It is useful and beneficial to consider green building ratings systems not as an added layer of requirements to a design for incorporation at the later stages, but as tools to be used throughout the design process to aid in the achievement of high performance building.

⁹ Canada Green Building Council. (December 2004). LEED Green Building Rating System for New Construction and Major Renovations LEED® Canada-NC Version 1.0.

http://www.cagbc.org/uploads/FINAL_LEED%20CANADA-NC%201.0_Green%20Building%20Rating%20System.pdf

Individual team members seeking an in depth knowledge of LEED® can obtain training and accreditation through the Canada Green Building Council. The LEED® Accredited Professional (LEED® AP) designation allows professionals to become more skilled with the application of the LEED® Green Building Rating System. A knowledgeable team member could orient the team to green building and LEED® at the start of the project.

2. Register Your Project – The first step to LEED® certification is to register the building project with the Canada Green Building Council. The proponent or design team will benefit from registering the project as early as possible. By registering their project, proponents gain access to LEED® documentation templates and online access to reference resources that may help the team better understand LEED® requirements and more effectively incorporate them into their project from the start. Moreover, by registering its project, the team is allowed to submit credit interpretation requests to the Canada Green Building Council. Two credit interpretation requests for each registered project are included in the registration fee for each project. Credit interpretation requests can help a team understand the requirements of a LEED® credit in the context of the particular project.

To register a project with the Canada Green Building Council, go online to:
http://www.cagbc.org/leed/project_registration/index.htm

3. Develop Good Specifications – Incorporating the chosen LEED®, or other green building requirements, into the project specifications in an effective and efficient manner is an important step in achieving the overall objective of LEED® certification. Increasingly, the necessary resources are available that specification writers need in order to incorporate green building requirements, including LEED®, into their construction specifications.

For example, to address the need for a comprehensive guide for procuring green building products and construction services within the U.S. Federal government, the U.S. Environmental Protection Agency has partnered with the U.S. Federal Environmental Executive and the Whole Building Design Guide (www.wbdg.org) to develop the *Federal Green Construction Guide for Specifiers*:
<http://www.wbdg.org/design/greenspec.php>

4. Simplify the Documentation Process – To achieve LEED® certification for a building project with the Canada Green Building Council, the proponent must submit the necessary documentation. The Green Building Coordination Team recommends three strategies to simply this process. Under the first strategy, the proponent should acquire a clear understanding of this requirement from the very start of the project. As mentioned in point 2 above, LEED® documentation templates are provided when the project is registered with the Canada Green Building Council.

As a second strategy, for each documentation requirement the proponent should begin completing the documentation at the first available opportunity as the project progresses toward completion. This strategy will reduce the cost of preparing the documentation, since the proponent won't need to assemble all the documentation at the end of a project. Indeed, leaving this work to the end of the project may not

only cause excessive time and costs for completing the documentation, but could jeopardize the LEED® certification all together.

As a third strategy, the proponent should incorporate the requirement into the specification documents where appropriate. This measure will help to spread the responsibility for capturing the required information, which has been shown to significantly reduce the cost of LEED® documentation.

7.2 LEED® Certified Wood Credit

There are three forest certification programs in use in Canada:

1. Forest Stewardship Council (FSC)¹⁰
2. Canada's National Standard for Sustainable Forest Management (CSA)¹¹,
3. Sustainable Forestry Initiative (SFI)¹².

For project proponents choosing to pursue the *Certified Wood* credit within the Material and Resources category of LEED®, *LEED® Canada-NC v1.0* currently only recognizes the FSC program.

Potential Strategies

Specifying FSC certified wood in a building or renovation project may not always be feasible. For example, depending upon the geographic location of the project, FSC-certified wood supplies may be limited. As well, in order to help achieve other objectives, such as the use of local materials, it may not make sense to use FSC wood.

For examples of how to achieve other credits in LEED® for the use of wood, without having to use FSC certified wood, see the *Guide to the Use of Wood in LEED® Projects* prepared by Larry McFarland Architects, Ltd. and available from the Greater Vancouver Regional District.

Guide to the Use of Wood in LEED® Projects:

<http://www.gvrd.bc.ca/buildsmart/pdfs/Guide%20UseWoodInLEEDProjects031014-1.pdf>

¹⁰ Forest Stewardship Council: <http://www.fsc.org>

¹¹ Canada's National Standard for Sustainable Forest Management: http://www.csa-international.org/product_areas/forest_products_marking/Default.asp?language=english

¹² Sustainable Forestry Initiative: <http://www.sfiprogram.org/>

8. Energy Requirements

This section refers to items in Section 4.3 of the Policy, which describes energy-related requirements that projects must meet.

8.1 Energy Efficiency

In addition to achieving a minimum of Silver certification under the LEED® rating system, each project must:

- achieve at least three points under the *Optimize Energy Performance* credit of the LEED® rating system; and
- comply with the requirements to achieve designation as a Power Smart Building in accordance with Manitoba Hydro's Power Smart design Standards for New and Renovated Buildings (Second Edition).

Rationale

In Manitoba, as in many jurisdictions with green building policies, reducing energy use is a primary goal. In this case, the three additional energy performance points under LEED® referenced above will ensure that new buildings will be designed to use at least 33% less energy compared to a reference building defined by the *Model National Energy Code for Buildings of Canada 1997*. For major renovations, this will ensure a reduction in energy use of 24%. As well, the energy performance credit referenced above falls under the *Energy and Atmosphere* category in the LEED® rating system, the largest category in terms of potential points.

In order to ensure that projects are documented properly and to completion, and that each eligible project pursues incentives from all available programs, proponents will need to meet the requirements for the above mentioned design guidelines through Manitoba Hydro and Natural Resources Canada.

Potential Strategies

Project teams may find it helpful to understand at an early stage of a project the various points available under the *Optimize Energy Performance* credit of LEED®.

Similarly, the project team will benefit from reviewing and understanding Manitoba Hydro's Power Smart Design Standards.¹³ It is also useful to regularly review the financial incentives available through Manitoba Hydro's Power Smart Commercial Programs¹⁴ and Natural Resources Canada's ecoENERGY Efficiency Initiative¹⁵, as programs and program requirements typically change over time. Regardless of the specific strategy selected, the use of energy simulation software will be indispensable in the development of a suitable and cost-effective strategy.

¹³ Manitoba Hydro Power Smart Design Standards:

http://www.hydro.mb.ca/your_business/design_standards/index.shtml

¹⁴ Manitoba Hydro Power Smart Commercial Programs:

http://www.hydro.mb.ca/your_business/savings_commercial.shtml

¹⁵ Natural Resources Canada ecoENERGY Efficiency Initiative: <http://oee.nrcan.gc.ca/english/index.cfm>

8.2 Low or Zero Carbon Renewable Energy Sources

This section refers to items in Section 4.4 of the Policy which explains that all new buildings covered by the Policy must give preference to renewable low or zero carbon energy sources and systems.

Clarification

In the Policy, the government expresses a preference for “renewable low or zero carbon energy sources and systems.” This priority is intended to promote “green building” as part of a shift toward sustainability. This shift will include moving to low and zero carbon buildings. Design teams are expected to make a substantive and reasonable effort to include cost-effective low and zero carbon energy sources for all loads.

For the purposes of this Policy, electricity generated in Manitoba may be considered a low carbon energy source. However, the government expects design teams to look beyond electrical resistance heating.

As a key part of this undertaking, design teams should develop and simulate a process to integrate the assessment and implementation of cost-effective green measures. For economic reasons, some efforts may involve incorporating ‘conventional’ energy sources in whole or in part based on situational factors (e.g., ground source and drilling availability, availability of electricity, remote area maintenance and accessibility).

Rationale

Manitoba derives its electricity largely from renewable hydroelectric power. Electricity is valuable for many uses and should not automatically be consumed on low grade technologies, such as simple resistance heating, if a better option can be made affordable. (See “Rationale” in Section 8.3.).

Design teams should consider green building as the best and preferred option for new and large retrofit projects. The government recognizes the fact that it will take time to adapt to new cultures and technologies and that some compromises may have to be made along the way. But taking an exemption based on cost should not to be automatically initiated in order to avoid undertaking green building. This exemption is only available in recognition of the reality that sometimes technologies and measures need time to be developed.

Potential Strategies

To successfully apply the use of low or zero carbon renewable energy sources, proponents will need an integrated system design involving a combination of energy sources. They will need to integrate “negawatt” sources of conservation and efficiency, and likely multiple-effect harvesting of any energy source, by such means as heat recovery or series usage. In most instances a renewable energy source will be optimal at providing less than 100% full load fraction. See Policy Sections 4.5 and 4.6.

To be successful, this application will also require proponents to take advantage of Manitoba Hydro’s renewable energy initiatives, including those involving enhanced hydroelectricity, biomass fuel, and wind power. They should also take advantage of the

programs provided by such organizations as the Manitoba Sustainable Energy Association¹⁶.

8.3 Carbon-Based Energy Sources

This section refers to items in Section 4.5 of the Policy which states that in cases where low or zero carbon energy sources are not cost effective on a life-cycle cost basis for a building's base and intermittent loads, a high efficiency carbon-based fuel system may be considered.

Clarification

For portions of significant building loads where it is found to be cost-effective, the design team should consider and implement the optimum mix of zero carbon, low carbon, and carbon-based energy sources and systems. It may be cost prohibitive and impractical to serve more than a portion of one of several available heating loads with innovative energy sources, and even then that load may require full back-up by a conventional fuel source.

- **Base Envelope and Continuous Ventilation Heating Loads**

High efficiency carbon-based fuel systems shall operate with combustion efficiencies in excess of 90% for propane or natural gas, and 85% for fuel oil, where applicable. Heat recovery systems shall be incorporated into ventilation systems to minimize energy usage where it is cost-effective, unless a specific rationale can be provided that demonstrates that it is not practical.

- **Intermittent or Non-Continuous Ventilation & Infiltration Loads**

Electric heat should not be used to serve these loads, which will result in high billing demand charges for owners, and contribute to Manitoba Hydro's winter system peak. Heat recovery systems shall be incorporated into ventilation systems to minimize energy usage where it is cost-effective and practical.

- **Service Water Heating Loads**

All water heating equipment, boilers and storage tanks serving this load shall meet or exceed the criteria listed in the latest version of ASHRAE Standard 90.1.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers:

<http://www.ashrae.org/>

Rationale

Electricity in Manitoba is a low carbon energy source because it is primarily generated from renewable sources. From a local perspective, using electricity for heating instead of carbon-based fuels will reduce local greenhouse gas emissions. Conversely, from a global perspective, if Manitobans heat efficiently with carbon-based fuels instead of electricity, Manitoba Hydro can then export renewable source electricity to displace carbon-based thermal electricity generation (coal and natural gas). In neighbouring

¹⁶ Manitoba Sustainable Energy Association: www.mansea.org

markets, carbon-based electricity generation operates at much lower efficiencies (less than 35% efficiency) than the heating equipment used locally. Therefore, net reductions of global greenhouse gas emissions are achievable by this practice.

Since significant greenhouse gas emissions are evident under both perspectives, it is acceptable to use high efficiency carbon-based heating systems instead of electric resistance heating systems in cost-effective situations.

Potential Strategies

For example, a solar ventilation pre-heat wall can provide a portion of the ventilation heating requirements when solar energy is available, but would require natural gas to provide part of or the entire load when solar energy is unavailable. The use of electric make-up air heating would incur high demand costs, which should be minimized by incorporating heat recovery systems. Alternatively, design teams could consider using air-to-air heat recovery on a gas-fired makeup air system equipped with a carbon dioxide-sensing, demand-controlled ventilation system.

Geothermal heating systems may prove to be cost effective for 50 to 100% of the base building transmission and infiltration heating loads, assuming the building site has adequate space to construct a ground heat exchanger or access to groundwater wells. However, the balance of load may be most cost-effectively covered by efficient natural gas, propane or fuel oil systems utilizing ventilation air heat recovery or solar fresh air pre-heating.

8.4 Flexibility of Energy Source

This section refers to items in Section 4.6 of the Policy which states that to reduce exposure to future energy price volatility and to facilitate future changes to alternative energy sources, systems should be designed for flexibility of energy source.

Clarification

The design professional should review all options relative to heating equipment and their distribution systems, so as to minimize the impact of retrofitting the system to an alternative energy source. If allowed by the type of building or occupancy, the systems will be readily adaptable to primary heating equipment replacement (should future circumstances dictate switching to alternative energy sources).

Rationale

The availability of alternative energy sources and the economics of each source will change over the life of a building. With “flexibility,” building owners will have the option of choosing a green fuel of choice without having to invest a large amount of capital in the conversion of their heating system. Providing for this flexibility will allow the building owners the option to switch to alternative fuels as necessitated by future conditions.

Potential Strategies

Design professionals should investigate HVAC & R system alternatives with their design teams, including the architects and the building owners, early in the integrated design process. When a low temperature hydronic heating system is identified as one of the Owner’s Project Requirements (OPR), other non-conventional building/system

components may then be considered as required to accommodate the future flexibility of such a heating system. Alternative off-site green and green hybrid fuel sources, though not available during initial construction, should be considered in the design of the site development and mechanical room layout. Once again, this is to allow for the least obtrusive renovation to the building when switching fuels becomes an option or a necessity. Also, current fuel rates and billing structures will not prevail over time. Some additional strategies should be reviewed when considering this eventuality.

These considerations are all likely to bring forth the question, “What do I do with smaller buildings where hydronic systems are not cost effective?” When considering future alternative fuel and price options, in many instances replacing HVAC equipment, such as rooftop units and furnaces, may be the simplest approach for implementation in multi-tenant occupancies. Modular systems in these cases may be the most cost-effective approach for future alternatives.

Designing radiant or low temperature heating systems becomes viable in extreme climates when the heating load is reduced through appropriate architectural considerations and trade-offs. In some instances, energy modeling of the building and its energy-using systems will help design teams achieve this flexibility.

Another option to consider when pursuing flexible heating systems is to de-couple them from other mechanical systems, such as ventilation and air conditioning.

Wherever possible, design teams should consider using dual fuel systems when the building is first constructed. Similarly, in the design stage, once the design team knows the fuel sources and primary heating equipment, it should include flexibility in the control or rate of consumption for each fuel source.

9. Adaptive Reuse and Deconstruction of Existing Buildings

This section refers to items in Section 4.7 of the Policy.

The Policy states “Consideration shall be given to the adaptive reuse of existing buildings, especially those of significant cultural or historic value, to capture the embodied energy and other resources that these buildings contain. Where it isn’t feasible to reuse an existing non-designated building, the deconstruction and reuse of the building materials rather than demolition should be explored.”

Rationale

The benefits of reusing buildings vary, and can include:

- lower material costs;
- reduced transportation costs;
- access to unique on-site materials that may otherwise be unavailable;
- capture of embodied energy in existing building materials; and
- reduced construction waste.

Adaptive reuse should be considered in all cases, but especially so when the existing building has significant historic or cultural value. There are also several points in the LEED® rating system for the adaptive reuse of buildings.

When reusing an existing building isn’t feasible, proponents should consider deconstructing the building and reusing as much of the materials as is feasible. This measure will reduce construction waste and make available materials that are still serviceable for the construction of a new building or the renovation of a building. Adaptive reuse and deconstruction should always be considered as an option to demolition.

Potential Strategies

In order to determine whether adaptive reuse and/or deconstruction have merit, proponents should first determine whether the existing structure has significant historic or cultural value. Proponents will normally make this assessment early in the site selection and design process by examining municipal, provincial, and federal listings of significant buildings. Proponents should also conduct a survey of the existing building’s facilities in order to determine what advantages adaptive reuse or deconstruction may offer. Costs can be reduced by choosing one of these options rather than demolition and new construction.

The Canadian Standards Association Guideline for Design for Disassembly and Adaptability in Buildings (CSA Z782-06) provides a framework for reducing building construction waste through disassembly and adaptability design principles. The Guideline can be used “...to identify design approaches and criteria for waste reduction, to develop system-specific disassembly and adaptability conscious details, and to adopt specific strategies for building structure and envelope.”

CSA Guideline for Design for Disassembly and Adaptability in Buildings:

<https://www.csa-intl.org/OnlineStore/GetCatalogItemDetails.asp?mat=2418357&parent=6>

10. Green Building Coordination Team

This section refers to Section 5.1 of the Policy, which describes the duties of the Green Building Coordination Team (GBCT) in administering and supporting the Policy.

Clarification

The GBCT is a cross-departmental group of staff within the Manitoba Government. The team is comprised of members of Manitoba Science, Technology, Energy and Mines, Green Manitoba, and Manitoba Hydro. The GBCT reports to an Interdepartmental Working Group (IWG), co-chaired by Manitoba Finance and Manitoba Science, Technology, Energy and Mines.

Rationale

The GBCT's cross-departmental format was chosen over a stand-alone unit within a government department because this approach allows greater access to expertise from several departments in the Manitoba Government. Much like the Interdepartmental Working Group (IWG), the GBCT offers broad support for implementation of the Policy through this breadth of departmental representation.

Potential Strategies

In its support of the implementation of the Policy, the GBCT is a resource to the province and, in a limited capacity, to local industry. The GBCT is responsible for coordinating the implementation of the Green Building Policy, including these principle duties:

- Developing and maintaining the Implementation Guide;
- Creating and managing a green building web site (www.gbmanitoba.ca);
- Helping to coordinate education for organizations impacted by the Policy;
- Collaborating with a broad range of stakeholders to help ensure the necessary skills and tools are available for effective Policy implementation;
- Providing interpretations regarding the application of the Policy;
- Monitoring the impact and outcomes of the Policy; and
- Drafting future expansions of the Policy for the Working Group.

11. Independent Verification

This section refers to Section 5.2 of the Policy, which addresses independent verification of proponent's projects to ensure they meet the Policy's requirements.

In order to ensure that all design, environmental, and energy requirements have been met on a particular project, proponents are required to provide the GBCT with independent, third-party verification in writing. This verification should be obtained from:

1. The Canada Green Building Council for LEED® certification;
2. Natural Resources Canada's *ecoENERGY Efficiency Initiative* for buildings and houses validating (if eligible) of the project's anticipated energy performance; and
3. Manitoba Hydro, confirming that the Corporation has accepted a signed letter of commitment from a registered architect or engineer stating that the proposed design will meet or exceed Hydro's Power Smart design standards for new and renovated buildings.

Rationale

Within the context of a Green Building Policy, verification by one or more third parties must occur in order to fully recognize compliance and to monitor the impacts of the Policy over time. If each project has a third-party verification, the Green Building Coordination Team can accurately analyze trends within the Policy, and determine the impacts of the Policy on building practices in Manitoba.

Potential Strategies

Proponents should become familiar with the requirements of each of the organizations listed above – Canada Green Building Council, Natural Resources Canada, and Manitoba Hydro – in order to ensure they are following the necessary processes to obtain the written documentation required. Questions regarding submittals to, and requirements of, these organizations should be directed to the applicable organization.

12. Equivalencies, Reduced Requirements, or Exemptions

This section refers to Section 5.3 of the Policy, which states that project proponents may suggest alternatives to the requirements of the Policy at the schematic design and cost-estimating stage.

Clarification

For a building project that would normally fall within the scope of the Policy to obtain an exemption in whole or in part from the Policy, a request for an opinion should be submitted in writing to the Green Building Coordination Team by the project proponent. The request should confirm that:

- the intent of the Policy will still be met;
- the energy and performance of the building will still meet or exceed the specific standards described in Section 4 of the Policy; and
- the life-cycle cost of the building will be equivalent to or less than it would have been had the building followed the Policy's requirements.

The adjustments to the requirements of the Policy may be warranted if the proponent can reasonably demonstrate that some or all of the requirements identified in Section 4 of the Policy are not effective on a life-cycle costing basis, or would unduly impair the usability, function, or aesthetics of the proposed building, addition, or renovation. This demonstration must be in writing, and must be provided by a registered architect, engineer, certified engineering technologist, or ecoENERGY Design Assessor. With the exception of the design assessor, these individuals must also be LEED® Accredited Professionals.

Additionally, certain projects may be exempt from some or all of the requirements in Section 4 of the Policy if the proponent can demonstrate that the building's occupancy, need, or site conditions make strict compliance with the Policy impractical. Some examples of this situation may include:

- designated historical buildings;
- temporary buildings;
- buildings or renovations needed in response to a public emergency;
- unoccupied buildings; and
- buildings with specialized functions.

The above list is demonstrative and not exhaustive. The GBCT will address requests for opinions about equivalencies, reduced requirements and exemptions that are specific to each project.

Rationale

The GBCT recognizes that while most projects will comply with the Policy, some projects, for a variety of reasons, may not be able to achieve compliance. However, the proponents of these projects will need to give reasons why compliance is impractical, and must propose how the project will still meet the intent of the Policy, while not meeting the letter of the Policy.

Potential Strategies

Proponents should determine as early as possible whether the project in question will require an equivalency, reduced requirement or exemption. Proponents should document this request and submit it to the GBCT as early as possible in order to allow for examination of the request.

The proponent should become familiar with the types of requests that lend themselves well to obtaining equivalencies, reduced requirements and exemptions, as this knowledge can help them in producing the request.

13. Technical Support

This section refers to items in Section 5.4 of the Policy, which states that the Green Building Coordination Team (GBCT) will provide proponents with the technical assistance they may require in interpreting the application of the Policy.

Clarification

As stated in Section 10 of this Guide, the Green Building Coordination Team (GBCT) is responsible for coordinating the implementation of the Green Building Policy. The Section lists the team's principle duties in fulfilling this responsibility. The GBCT will focus on providing support in areas where it is not feasible for others to provide support. If the support is available elsewhere, then the GBCT will call on that support rather than provide a duplicate service.

Potential Strategies

A range of support is available from the following sources:

If you have **questions about the Green Building Policy** or the application of the Policy please contact the Green Building Coordination Team:

Green Building Coordination Team
Tel: 1-866-626-4862
Email: greenbuilding@gov.mb.ca
Web: manitoba.ca/greenbuilding

If you have general **questions about the LEED® Green Building Rating System** please contact the Canada Green Building Council:

Canada Green Building Council
Tel: 1-866-941-1184
Email: info@cagbc.org
Web: www.cagbc.org

If your question is about the interpretation of a LEED® credit, the Canada Green Building Council may ask you to submit a formal credit interpretation request. Each project registered with the Council is eligible for two free credit interpretation requests.

To register a project with the Canada Green Building Council visit:
http://www.cagbc.org/leed/project_registration/index.htm

If you have **questions about Manitoba Hydro's Power Smart Design Standards**, or any of the Power Smart incentive programs, please contact Manitoba Hydro:

Manitoba Hydro Power Smart for Business:
Tel: 1-888-624-9376
Email: powersmartforbusiness@hydro.mb.ca
Web: www.hydro.mb.ca/psfb

If you have **technical questions about green building**, including questions about the specific application of LEED® to your project, the GBCT recommends that you locate a suitably experienced industry professional who is a LEED® Accredited Professional. A

directory of LEED® Accredited Professionals in Manitoba, as well as across Canada, is available on the Canada Green Building Council web site.

LEED® Accredited Professional directory:
http://www.cagbc.org/leed_ap/directory.htm

14. Budgeting and Financial Implications

This section refers to items in Section 6 of the Policy, which states that based on green building practices in Manitoba and other jurisdictions, any increase in capital costs needed to satisfy the Policy will be modest.

Clarification

The cost premium of green building is usually modest, and can be offset by: lower operating and maintenance costs, increases in productivity, and enhanced asset value (although the professional appraisal community has not yet developed standards of practice for ascribing value to green building features).

Calculating the financial advantages of green building varies from project to project, but can be achieved through a detailed life-cycle costing analysis. A life-cycle costing analysis for projects under this Policy shall use the following set of uniform figures:

- 6.0% discount rate;
- 2.0% annual escalation rate for electricity costs;
- 3.0% annual escalation rate for natural gas, propane, and fuel oil costs;
- 2.5% annual escalation rate for building operation costs (excluding energy);
- up to 1.0% for the reduction in staffing costs due to increased productivity;
- \$15 per tonne for greenhouse gas emissions (CO₂ equivalent).

Rationale

By conducting a life-cycle cost analysis of a building, the project proponent will come to understand how the building will perform, economically, over its expected lifespan. In Manitoba, the lifespan of a building tends to be long, which allows more time to achieve the payback required, and more time to enjoy the benefits associated with green buildings.

The figures provided above were gathered from a number of different sources and may change over time. When figures change they will be issued in a new version of this guide. The Green Building Coordination Team encourages users of the guide to provide feedback to the Team on the figures and suggest alternative figures if it is believed better numbers are available.

The 6.0% discount rate is consistent with rate used by the Province of Manitoba Treasury Board for capital projects.

Long-term energy prices (especially natural gas) are difficult to predict. To be conservative, the annual escalation rates for fossil fuels (i.e. natural gas, fuel oil and propane) are assumed to rise slightly higher than the cost of living. Electricity prices, which tend to be more stable, are predicted to rise at a rate slightly lower than the cost of living.

The 2.5% annual escalation rate for building operating costs (excluding energy) is derived primarily from the Conference Board of Canada's forecast for the Manitoba Consumer Price Index.

An optional allowance of up to 1.0% for the reduction in staffing costs due to increased productivity (e.g., fewer sick days, lower staff turnover) is a conservative number based upon a review of the preliminary research in this area.

Finally, the \$15 per tonne for greenhouse gas emissions is an interim value used by the Government of Canada.

Potential Strategies

By undertaking detailed life-cycle costing as early as possible within the project timeline, the proponent will help ensure that the project's details are available for discussion and review. A strong business case for the building, supported by detailed life-cycle costing analysis, will contribute to the project's Policy compliance and construction.

Applying life-cycle costing should include undertaking several steps:¹⁷

- Designers should become familiar with nationally recognized life-cycle costing techniques and procedures;
- Preliminary project descriptions should be prepared by each discipline at the project schematic design phase in order to define a baseline concept against which alternatives can be compared; and
- Energy analysis using simulation software should be conducted for the baseline design.

Applying life-cycle costing is well-suited to sustainable building design and construction, since the design, cost, and energy data will be available early in the design process. The proponent should take the steps to apply life-cycle costing early in the schematic design process. Otherwise, if these steps are taken during design development, the proponent may find that many relevant decisions have already been made.

¹⁷ Life Cycle Costing: <http://www.lifecyclecosting.org/applying-life-cycle-costing.html>

15. Monitoring and Review

This section refers to items in Section 7.1 of the Policy, which states that the impacts of the Policy will be assessed on an ongoing basis.

Clarification

The Policy states that the effect of the Policy will be assessed on an ongoing basis between April 1, 2007 and March 31, 2008, at which time an interim review will be conducted by the Green Building Coordination Team (GBCT). The Team will then present its findings and recommendations to the Manitoba Green Building Policy Interdepartmental Working Group (IWG). The GBCT will conduct an in-depth review of the Policy by March 31, 2009, and will then again make recommendations to the Interdepartmental Working Group.

Rationale

In order to evaluate the impact of the Policy and implement improvements, regular reviews must be completed and recommendations made to the Interdepartmental Working Group and Treasury Board. These recommendations will be based on evidence available as well as on the response to the Policy by Manitoba's building design and construction community.

Potential Strategies

Providing the GBCT with feedback is an excellent way for Manitoba to achieve the best possible green building policy. To provide feedback please send an e-mail to greenbuilding@gov.mb.ca or call 1-866-626-4862.

16. Project Contact Person

This section refers to items in Section 7.3 of the Policy, which states "For each building project affected by this Policy, organizations identified in 3.2 [Organizations Affected by this Policy] shall appoint a contact person who will be deemed to be responsible for ensuring compliance with this Policy."

Section 3.2 in the Policy is titled "Organizations Affected by this Policy," and is addressed in Section 4 of this Implementation Guide.

Rationale

Having one contact person for each project will help ensure accountability in the implementation of the Policy.

It will also serve to maintain a strong network of project contacts within Manitoba, in both the public and private sectors. In the case of a project that is owned by the Government of Manitoba, the project contact person should be a representative of the department involved. In the case of a project that is provincially-funded but owned by an entity other than the province of Manitoba, the project contact person should be a key member of the design team involved in the project.