



NEW BUILDINGS PROGRAM 2.2

PERFORMANCE PATH PROGRAM GUIDE

DESIGN WITH ENERGY EFFICIENCY IN MIND.





New Buildings Program 2.2 – Performance Path

PROGRAM GUIDE

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INTRODUCTION

The New Buildings Program 2.2 – Performance Path provides technical guidance and financial incentives for designing, constructing, and operating new, energy efficient buildings in Manitoba.

For a building to receive an energy efficiency certification through the New Buildings Program – Performance Path, it must be designed to be at least 10% more energy efficient than the minimum requirements of the Manitoba Energy Code for Buildings (MECB) 2013.

During the building’s design phase, energy modelling is used to demonstrate that the building’s design meets these minimum standards as described in the program deliverables section of this Program Guide.

Financial incentives

The Performance Path offers a financial incentive ranging between \$0.50/sq. ft. – \$2/sq. ft. of the new building’s eligible floor space, as determined by the project’s final energy model.

This incentive is paid to the building owner (as indicated on the New Buildings Program application) upon completion of the project and once all program deliverables have been submitted and approved.

Building energy targets will be rounded down to one decimal point to determine the incentive factor used for the incentive calculation. (E.g. A building energy target of 10.55% better than MECB yields an incentive factor of \$1.05/sq. ft.). An incentive factor cannot be less than \$0.50 nor larger than \$2.

Eligible floor space is the sum of all the floor areas within the building that are conditioned or semi-conditioned year round (including basements, mezzanines, penthouses, and parking garages) with a headroom height of 7.5 ft. or greater. Semi-conditioned spaces are any enclosed spaces within a conditioned building that are heated by a heating system whose output is greater than or equal to 0.9W/sq. ft. of the semi-heated floor area. Crawl spaces, attics, and other unconditioned areas are not to be included for the program’s incentive calculation.

The eligible floor space area is measured from the interior face of the exterior walls or from the centerline of walls separating buildings.

New construction projects must meet all of the program’s eligibility criteria to qualify for financial incentives. Consult this Program Guide for details regarding all program deliverables.

	Building energy target (% better than MECB)	Incentive factor (\$/sq. ft.)
	5%	\$0.50
	6%	\$0.60
	7%	\$0.70
	8%	\$0.80
	9%	\$0.90
Energy efficiency certification levels	10%	\$1.00
	11%	\$1.10
	12%	\$1.20
	13%	\$1.30
	14%	\$1.40
	15%	\$1.50
	16%	\$1.60
	17%	\$1.70
	18%	\$1.80
	19%	\$1.90
	20%	\$2.00

Technical assistance and guidance

Efficiency Manitoba offers technical assistance and guidance in the various disciplines within energy efficient building design and operation. Such expertise is intended to complement the skills of a project’s design team and offers a unique perspective in designing, constructing, and operating an energy efficient commercial building in Manitoba.



PROJECT ELIGIBILITY

The New Buildings Program 2.2 - Performance Path is available to building owners who are constructing new commercial buildings in Manitoba that meet the following criteria:

- The Building Owner must be a Manitoba Hydro customer eligible for the General Service Electricity Rate.
- This Program applies to new construction projects classified as Part 3 buildings that are required to follow the
- Manitoba Energy Code for Buildings 2013 (MECB), as determined by the Authority Having Jurisdiction. Commercial buildings not required to follow the MECB may also apply; however, Residential, Multi-Unit Residential, Farm, Industrial, and Manufacturing buildings that are not required to follow the MECB are not eligible for this Program.
- The Building Owner must be the current registered owner of the property for the building and of the building.
- Incentives are not available for projects completed as of the date Efficiency Manitoba approves this Application.
- Performance Path applications must be received and approved by Efficiency Manitoba **no later than six months after a building permit has been issued** for the applicable project. (This does not include foundation permits.)
- Program eligibility shall be at Efficiency Manitoba's sole determination based on the Application and the Customer's compliance with Program requirements of Efficiency Manitoba.
- This Incentive is conditional upon the Building Owner remaining a Manitoba Hydro customer in good standing for a minimum period of 36 consecutive months from the date of last payment of the Incentive. In the event that the Building Owner ceases to be a Manitoba Hydro customer in good standing prior to the expiry of the said 36 month period, the Building Owner shall forthwith repay to Efficiency Manitoba the full amount of the Incentive awarded.
- The Building Owner must at all times comply with all applicable federal, provincial, municipal, laws, by-laws, regulations, and codes, which are, or may hereafter become, applicable, to the Building Owner, the building (including, without limitation, its design, construction, operation), the project and/or any of the team member(s) or other contractor(s), and with all requirements of MH relating to the Program, Application, Incentive, Incentive Agreement, energy supply and/or account(s).
- Efficiency Manitoba must be promptly notified of any change to the building's design at all times, otherwise the project may be determined by Efficiency Manitoba to be ineligible for any Incentives.

Ineligible building types

Industrial, manufacturing, agricultural, residential, and multi-unit residential buildings that are not classified as Part 3 buildings and not required to follow the MECB are not eligible under this program. However, buildings deemed to be ineligible may qualify for financial incentives through other Efficiency Manitoba programs. Please contact us to determine your building's eligibility.

Additional programs available for new commercial buildings

In addition to the New Buildings Program 2.2 - Performance Path, Efficiency Manitoba offers a variety of incentive programs for commercial and institutional building owners. New construction projects participating in the New Buildings Program are eligible to apply for these additional programs as long as the energy efficiency measures covered by those programs are not already included in the building's energy model.

Each program has specific application requirements that are independent of the New Buildings Program 2.2 - Performance Path.

Please visit Efficiency Manitoba's website efficiencymb.ca for a complete list of additional programs. If you have any questions or require assistance, please contact us directly at newbuildings@efficiencymb.ca.



FUNDAMENTAL PRINCIPLES

The New Buildings Program 2.2 - Performance Path is dedicated to advancing the local building design industry in four particular areas: integrated design process (IDP), building performance simulations or energy modelling, building commissioning, and energy management/ measurement and verification.

Integrated design process

The IDP is a collaborative approach to designing a new building. At the start of the design process, the owners, architects, engineers, energy consultants, building occupants, community members, and other specialists or interested parties come together to collectively establish goals and objectives for the building and its eventual performance, with special consideration to the owner's requirements.

Program representatives provide guidance to develop an Owner's Project Requirements (OPR) document early in the building's design phase that relates specifically to energy efficiency and the New Buildings Program. The OPR is a key component of a successful IDP; it is a required deliverable of the program, and it helps ensure the building owner's energy efficiency requirements are clearly established at the onset of the project.

The cooperation of the integrated design team from the beginning allows improvements to be made to the project early in the process. As the project moves forward, changes become timely, costly, and increasingly difficult to implement. The IDP focuses on the building as an interconnected system, rather than just individual parts and technologies; the latter of which is a product of a more traditional building design approach. The IDP allows the project team to address high performance and complex new buildings' challenges to ensure that all design team members understand the entire process. A significant step to designing a highly efficient building is to ensure the building's multiple systems complement one another.

Energy modelling (building performance simulations)

Energy modelling, also referred to as building performance simulation, is a process that simulates an entire building's design with respect to its energy consumption and performance. The simulation compares the building's design with an established baseline. Energy modelling uses specialized software to create simulations under specified parameters, which are used to help evaluate design and construction options for a project.

Implementing energy modelling early in the design process can help identify opportunities for energy efficient building design and reduce the need for modifications and change orders later on in the project. Energy models can simulate a variety of building details, such as roof and wall construction, lighting power densities, domestic hot water usage, heating and ventilation systems, occupancy schedules, and more. Changing variables, such as outdoor/indoor temperature, solar orientation, humidity, energy costs, construction materials, and occupant levels allow the energy modeler to produce a variety of scenarios and optimize the building's design to meet energy efficiency objectives.

The results of the energy model, completed during the project's design phase, determine whether a building is eligible for the New Buildings Program 2.2 - Performance Path and energy efficiency designation. The proposed new building's simulation results must be measured against the base case simulation results, as if the building were built to just meet the requirements of the Manitoba Energy Code for Buildings (MECB) 2013. The difference between these two simulations determines the efficiency of the new building's design and establishes the percentage better than MECB for the program's incentive calculation.



Building commissioning

Building commissioning is a quality assurance process that spans the entire design and construction phase of a new building. It is adapted for each project to ensure building systems operate efficiently, effectively, and reliably. Building commissioning formalizes the review and integration of all project expectations through functional performance testing, verification of operator training and systems manuals, and assessment of documentation to ensure that all the building's systems meet the criteria and objectives set forth in the OPR.

This systematic process is improving the overall quality of commercial buildings due to the numerous benefits of building commissioning, including improved coordination between design, construction, and occupancy; proper and efficient equipment operation; enhanced indoor air quality, occupant comfort, and productivity; reduced operation and maintenance costs; and longer lifespan of equipment.

Energy management/measurement and verification

A building can be designed and constructed with the most energy efficient features and may not actually perform, once it is operating, to the originally set standards. Building owners may never realize their building's full energy efficiency potential. Just as a car's fuel efficiency ultimately depends on the driver, a building's energy efficiency is dictated by its operation staff and its occupants.

A measurement and verification (M&V) plan, along with regular energy management, can help a building's owner and operation staff reap the benefits of a facility designed and constructed to high-performance standards. Issues with building equipment, energy systems, or even occupancy behaviour that may have otherwise been unnoticed, are easily diagnosed and corrected with the help of a M&V plan.

The International Performance Measurement and Verification Protocol (IPMVP) M&V uses measurements to determine savings that are created within an individual facility by an energy management, energy conservation, or energy efficiency project or program. M&V helps ensure that energy savings and the investment in high efficiency equipment are maintained over time. The M&V plan contains a set of standard metrics for the facility that can be used to establish a baseline performance level and determine energy savings. Having an M&V plan in place is critical for the energy management of a facility.



HOW TO PARTICIPATE

The following is a step-by-step description of the New Buildings Program 2.2 - Performance Path requirements.

To participate in the New Buildings Program 2.2 - Performance Path, applicants must complete all of the steps and submit the deliverables that are detailed on the following pages. These steps and deliverables are intended to incorporate all four of the program's fundamental principles into the design, construction, and operation of the new building.

1. Submit a completed **New Buildings Program 2.2 - Performance Path application form** to Efficiency Manitoba.
2. Determine if the project is eligible for the Energy Modelling Assistance Incentive (see Appendix A).
3. Once the application is received and reviewed, the project will be formally enrolled in the program and an acceptance email will be sent to the building owner and project team. The correspondence will include information on next steps and will include this New Buildings Program 2.2 - Performance Path Program Guide. If the project is eligible for any additional programs, it will be outlined in this correspondence.
4. Where practical and applicable, a New Buildings Program representative will contact and meet with the building owner and appropriate project team members to complete an Owner's Project Requirements (OPR) document and to help ensure all energy efficiency deliverables are included in the project team's scope of work.
5. Where practical and applicable, a New Buildings Program representative will contact and meet with the building owner, commissioning agent, and any other appropriate project team members to help establish the project's specific commissioning requirements. New Buildings Program representatives can provide technical guidance and submission templates, and will help to ensure the required commissioning deliverables are included in the project team's scope of work.
6. Submit a copy of the project's Building Permit as issued by the Province of Manitoba, City of Winnipeg, or appropriate municipality or local authority having jurisdiction.
7. When construction begins, Efficiency Manitoba will offer to provide on-site signage to promote the project's energy efficiency objectives and its acceptance into the New Buildings Program.
8. The owner and/or consultant(s) responsible for providing the energy efficiency deliverables will submit these required documents as they are completed. The Basis of Design (BOD) is typically updated throughout construction and should be submitted once the building's final design elements have been confirmed. Similarly, the final energy model should be submitted once it has been updated to include all final changes to the building's architectural, mechanical, and electrical systems. Once construction is complete (or nearing completion) and the building is occupied, the Systems Manual should be developed and delivered and operator training should be carried out. Deliverables will be reviewed as they are submitted and applicable feedback will be provided. A New Buildings Program representative will confirm to the owner and project team when deliverables have been received and approved.
9. Once construction is complete and all program deliverables have been submitted for program compliance, a New Buildings Program representative will contact the building owner to arrange an optional program debrief and building operations meeting with the facility's operations staff.
10. A final review of all submitted deliverables will be completed upon receipt of all the final required documents, including the building's occupancy permit.
11. Upon successful completion of the program, communication will be delivered to the building owner and project team confirming that the project met the requirements of the New Buildings Program 2.2 - Performance Path. The confirmed incentive amount will also be delivered to the building owner.
12. Buildings that demonstrate an overall energy target of at least 10% better than the Manitoba Energy Code for Buildings (MECB) 2013 on the final energy model will be Certified Energy Efficient. A certificate will be presented to the owner for display in the new building and additional promotional materials can be provided upon request.

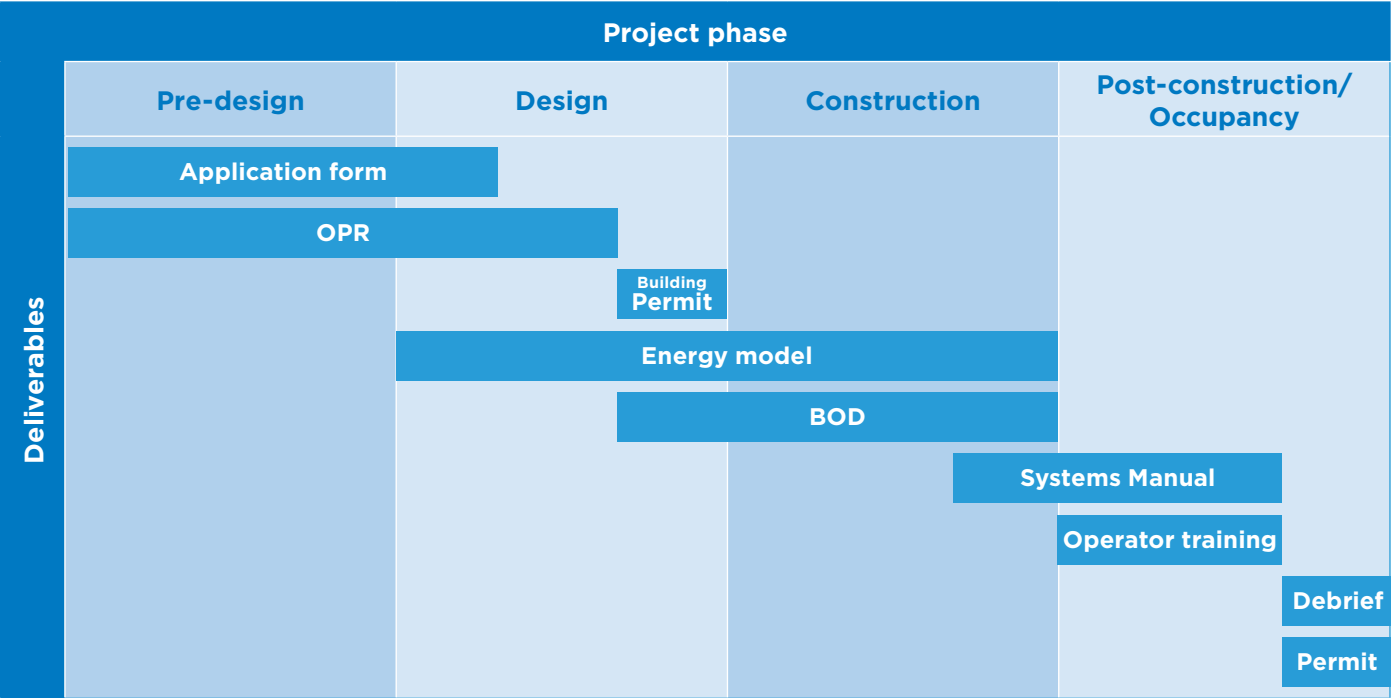


PROGRAM DELIVERABLES

Checklist

The following checklist provides an overview of the submission requirements for the New Buildings Program 2.2 - Performance Path. It is recommended that the building owner or project design team designate an individual to be responsible for collecting and submitting all completed program deliverables. All deliverables must be submitted prior to incentives being paid out. Details on each deliverable are provided on subsequent pages.

- New Buildings Program 2.2 - Performance Path application form
- Owner’s Project Requirements (OPR)
- Building Permit
- Energy model
- Basis of Design (BOD)
- Systems Manual
- Operator training
- Program debrief and building operations meeting
- Occupancy permit





1. New Buildings Program 2.2 - Performance Path application form

Intent of deliverable

The application form serves as the formal agreement between the building owner and Efficiency Manitoba with regards to participating in the New Buildings Program 2.2 - Performance Path. The form also summarizes project goals and intentions, lists the project's team members, and establishes a main point of contact for program communication and updates. All information assists in determining whether the project is eligible for the New Buildings Program 2.2 - Performance Path.

Submission requirements

A completed application form signed by the program applicant that owns (or will own) the newly constructed building.

Information on the application includes (but is not limited to):

- General contact information;
- Basic project information (building location, size, function, etc.);
- List of project team members and contact information;
- Project description and proposed schedule;
- Building energy target (percentage better than MECB) - See definition below;
- Energy use intensity target (ekWh/sq. ft.) - See definition below.

Additional information

Application forms are available online at efficiencymb.ca/newbuildings or by contacting us at:

newbuildings@efficiencymb.ca

Toll free: 1-844-944-8181

Local: 204-944-8181

Building energy target - This is the value (expressed as a percentage) by which a proposed new building design exceeds an energy efficiency baseline. The baseline for this program is the Manitoba Energy Code for Buildings (MECB) 2013. The financial incentive is calculated based on the proposed building's energy target as verified by the final energy model for the project.

	Building energy target (% better than MECB)	Incentive factor (\$/sq. ft.)
	5%	\$0.50
	6%	\$0.60
	7%	\$0.70
	8%	\$0.80
	9%	\$0.90
Energy efficiency certification levels	10%	\$1.00
	11%	\$1.10
	12%	\$1.20
	13%	\$1.30
	14%	\$1.40
	15%	\$1.50
	16%	\$1.60
	17%	\$1.70
	18%	\$1.80
	19%	\$1.90
	20%	\$2.00



Incentive calculation – Complete calculations. See adjacent chart to determine the building’s incentive factor.

Building size (Conditioned floor space)	Incentive factor (\$/sq. ft.)	Performance Path incentive	Performance Path EMAI*	Total requested incentive
_____ ft ²	x \$ _____	= \$ _____	+ \$ _____	= \$ _____

Note: Building dimensions to be confirmed by construction documents and/or actual site inspections before incentive payments are issued. Incentive amounts may be adjusted upon inspection. Final incentive factor will be adjusted (if necessary) based on the project’s final approved energy model.

*The Performance Path EMAI amount is optional and will be transferred from a completed Energy Modelling Assistance Incentive application.

Energy use intensity (EUI) target – Energy use intensity is a measure of energy consumption per building area (ekWh/sq. ft.). It is calculated by dividing the total energy (e.g. electricity and natural gas) consumed by the building in one year by the total conditioned floor space of the building.

When determining a building’s EUI target, consider the following list of energy use indices for new commercial building types in Manitoba.

Building type	Energy use intensity (at site) (ekWh/sq. ft.)
Office	13 to 15
K-12 school	16 to 20
Long-term care	40 to 49
Restaurant	77 to 101
Multi-unit residential	15 to 17
Retail strip mall	27 to 34
Big box retail	19 to 23

For a more exhaustive list of EUI targets, consult ENERGY STAR® Portfolio Manager’s Canadian Energy Use Intensity by Property Type technical reference. (<https://portfoliomanager.energystar.gov/pdf/reference/Canadian%20National%20Median%20Table.pdf>)



2. Owner's Project Requirements

Intent of deliverable

The Owner's Project Requirements (OPR) is a document that details the functional requirements and expectations of a project, including project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information. The OPR is a condensed collection of vital information regarding the construction project. The document is intended for the owner, design team, construction team, operation and maintenance staff, future renovation teams, and anyone who needs access to the original project information. The Basis of Design (BOD) will respond directly to this document.

The OPR is not a substitute for traditional architectural programming but can be considered a working document, as it is created during a project's kick-off meeting and updated throughout design, construction, and occupancy. Best practice would be to supplement a more detailed version of the OPR with the document created in this meeting. The completed OPR will be provided to all design team members upon completion.

Submission requirements

OPR signed by the owner and appropriate design team members signifying acceptance of the content.

Additional information

An initial meeting between program representative(s) and the building owner(s) formally introduces Efficiency Manitoba to the project and kicks off the development of the OPR. Energy efficiency related design objectives of the project will be established and documented for the entire design team. The completed OPR will also form the template for the BOD documentation to be completed by the project's design consultants later in the design process. Program-related questions will be addressed at the OPR meeting and the owner can ensure all program deliverables are within scopes of work.

Once these goals are established, project teams will have a unified vision and will be able to select strategies and design options that work together toward reaching them. Understanding the owner's goals, performance targets, budget, schedule, occupants' expectations, and programmatic requirements will promote synergies across building systems and creative problem solving.



3. Building Permit

Intent of deliverable

The building permit assures Efficiency Manitoba that the plans for the new building have been properly submitted and reviewed for compliance with the various parts of the Manitoba Building Code, Manitoba Fire Code and Canadian Electrical Code and any other applicable building codes and regulations including the Manitoba Energy Code for Buildings.

The building permit's date of issue is also used to determine a project's eligibility for the program.

Performance Path applications must be received no later than six months after a building permit has been issued for the applicable project.

Submission requirements

A copy of the building permit(s), as issued by the Province of Manitoba, City of Winnipeg, or appropriate municipality or authority having jurisdiction, must be submitted.

Note: Efficiency Manitoba is not an authority having jurisdiction over any part of the Manitoba Building Code and assumes no responsibility regarding the building owner's adherence to local building codes and regulations. Please see the liability section of the agreement on the original application for further details.

Additional information

Foundation, excavation, and/or demolition permits do not impact a project's eligibility for the program and are therefore not required to be submitted.



4. Energy Model

Intent of deliverable

Energy modelling is a tool that analyzes building design with respect to whole building annual energy performance throughout the design and construction process. Various options and assemblies can be simulated to assess compliance with the Owner's Project Requirements and energy efficiency targets. In addition to the energy performance of a new building design, these simulations can provide additional information such as day lighting, indoor air quality, and thermal comfort.

To determine program eligibility and financial incentives, provide the whole building annual energy performance as compared to the Manitoba Energy Code for Buildings (MECB) 2013 - Part 8: Building Performance Compliance Path.

Submission requirements

- 1. New Buildings Program's Energy Modelling Summary Workbook**
Provide the Energy Modelling Summary Workbook, which standardizes the minimum input and result information required for technical review and approval of the energy model.
- 2. Owner acceptance of the final energy model**
Provide confirmation that the building owner has received the final energy modelling submittal for their use.
- 3. Outdoor air calculations**
Provide a summary of the ventilation standard used.
- 4. Building zoning diagrams**
Provide clear diagrams of the building thermal zoning used in the simulation.
- 5. Electronic simulation files (reference and proposed buildings)**
Provide the final MECB reference case and proposed case energy models, including any additional models if required due to the simulation approach used.

6. Architectural, mechanical, and electrical drawings

Include a complete set of construction drawings/plans/specifications (architectural, mechanical, and electrical) used to construct the energy models.

7. Supporting documentation and reports

Include supporting documentation and relevant calculations used to derive the inputs and construction of the energy model. Also, provide any relevant reports generated by the energy modelling software program. The reports typically include detailed information on: modelled envelope assemblies, ventilation values (eg ASHRAE 62.1 inputs), lighting specifications, process and plug load details, zone heating & cooling loads, and hourly schedules.

The energy simulation submissions package shall be provided electronically once all major architectural, mechanical, and electrical (approved shop drawings) have been finalized and incorporated into the final energy model. A folder structure that resembles the submission requirements shall be used to assemble the submission.

Note: If necessary, the energy model will be verified against the as-built conditions of the project once the final commissioning deliverables have been submitted to ensure all final major elements of the constructed building have been included.

Additional information

- If there are energy saving technologies/strategies incorporated into the building's design that are not credited by the MECB's Part 8 – Performance Path, a case can be made to include these as part of the energy model in order to increase the incentives provided by the New Buildings Program. Be sure to consult a New Buildings Program representative to determine eligibility.



- Unlike MECB energy modelling guidelines, participating projects do NOT have the option to include exterior lighting in a new building's energy model. Additional financial incentives are available through Efficiency Manitoba's Business Lighting Program for new exterior lighting projects where LED fixtures are added to the exterior of a new building. Visit efficiencymb.ca/business/business-lighting for details.
- The building owner is responsible for obtaining energy model validation when qualifying for any other programs, government recognition initiatives, or for building code compliance. Qualification under the New Buildings Program 2.2 – Performance Path does not substitute validation for any other energy simulation requirements (e.g. LEED® certification, MECB compliance, CMHC financing).
- Efficiency Manitoba evaluates all submission documents and provides assistance to the design team on standard energy simulation practices and program-specific requirements. Efficiency Manitoba cannot provide the services of an energy modeller, but can provide guidance and technical expertise when simulating whole building energy use for new commercial buildings in Manitoba.
- A building's Thermal Energy Demand Intensity (TEDI, expressed as $\text{ekWh/m}^2\text{a}$) is the annual heat loss from a building's envelope and ventilation systems after accounting for all passive heat gains and losses. When calculated with energy modelling software, TEDI is the amount of heating energy delivered to the building that is outputted from any and all types of space heating equipment, per unit of gross floor area.



5. Basis of Design

Intent of deliverable

The Basis of Design (BOD) outlines the design solutions to the specific requirements detailed in the OPR. The document is created and maintained by the design team in consultation with a program representative as it records how the building's final design achieves the objectives listed in the OPR. Throughout the project, it is typically the role of the building commissioning authority (where applicable) to review the BOD against the OPR, to verify that the owner's specific requirements are being satisfied, identify any inconsistencies with the design team, and resolve any issues by changing the design (design team agrees to the change) or by changing the OPR (owner agrees to the change).

Submission requirements

- A completed BOD delivered to the building owner and appropriate design team members, signifying acceptance of the content.

Additional information

In most cases, project teams will receive a draft of the BOD from an energy efficiency representative identifying the building's design elements that have specifically addressed the items identified in the OPR. The building owner and/or design team members may edit and update the draft as needed in order to ensure its accuracy and completeness. Once approved, the final version of the BOD that is submitted to the program will be shared with the original design team members.



6. Systems Manual

Intent of Deliverable

The Systems Manual is a comprehensive documentation package that includes all information related to the building systems, assemblies, and commissioning processes. The package provides the owner and building operators with resources to understand, operate, and maintain the building's systems. The Systems Manual may be one of the most important documents created, as it ensures the building and its systems will be operated and optimized as per the intended design. This manual is not simply the Operations and Maintenance Manual, which makes up only a part of this package.

Submission requirements

- A complete Systems Manual developed and delivered to the building's owner and operations personnel (where applicable). Digital copies of the final Systems Manual are preferred for program submissions.

The following information must be included in the Systems Manual:

I. Executive summary

A narrative overview of the building's design, construction, and operational requirements which provides the building owner/operational staff/user with a basic understanding of the intended operation, performance, and maintenance of the building.

II. Facility design and construction

1. **Owner's Project Requirements (OPR)** — The final version of the OPR, including all updates made throughout the design and construction processes.
2. **Basis of Design (BOD)** — The final version of the BOD, including all updates made throughout the design and construction processes to accurately reflect the final design of the building.
3. **Construction/project record documentation** Provide (or identify the location of) the building's final design documents (as-built or record drawings).

III. Facility, systems, and assemblies information

1. **Specifications** — Provide final copies (or identify the location) of the building's design and equipment specifications.
2. **Approved submittals** — Provide (or identify the location of) final copies of approved submittals, including the commissioned sequences of operations for the building's equipment and systems (including limitations to operation).
3. **Manufacturer's operations and maintenance (O&M) data** — Provide (or identify the location of) the verified installation and O&M manuals (as provided by the manufacturer) for the building's systems and equipment.

IV. Facility operations

Develop and provide a Facility Guide. The guide is a basic building systems description and operating plan with general procedures and confirmed facility operating conditions, set points, schedules, and operating procedures for use by facility operations to properly operate the facility.

The Facility Guide must include the following:

1. **Operating plan:** a basic guide to aid in the proper operation of the building through describing fundamental building functions and management.
2. **Facility and equipment operating schedules:** details the basic time-of-day operating schedule for the building and other functions of the facility.
3. **Set-points, ranges, and limitations:** final installed and commissioned values used with the operational control sequences for the installed HVAC and other equipment in the building.
4. **Sequences of operations:** final installed and commissioned sequences of operation for the installed HVAC and other operating equipment in the building.
5. **Emergency procedures (optional):** details on specific emergency procedures recommended for this building and location of applicable controls.



6. **Maintenance schedules (optional):**
details of the equipment preventative maintenance schedule.

V. Commissioning process report

- Final commissioning report
Provide the final commissioning report with evaluation and records for each commissioned building system.
- Functional testing and start-up reports
Provide detailed testing sheets on the following energy related systems (at a minimum):
 - heating, ventilating, air conditioning, refrigeration systems, and associated controls;
 - lighting and day lighting controls;
 - domestic hot water systems;
 - renewable energy systems (e.g. wind, solar).

Include pre-functional checklists; manufacturers', testing agencies', and contractors' reports; and include all observations and recommendations for future reference.

Additional information

The amount of documentation in a commercial building's Systems Manual is extensive, however, a majority of the information and documents are available through the regular planning, design, construction, and commissioning processes. The mere collection and assembly of this information comprises the bulk of the System Manual's creation.

A separate commissioning agent is not required for New Buildings Program eligibility, however, building owners and/or project managers should ensure the Systems Manual and other building commissioning deliverables are clearly identified within the scope of work of either the commissioning agent or other project contractor(s) responsible for the building commissioning duties.

New Buildings Program representatives are available for a commissioning overview meeting to help establish the project's specific commissioning requirements as they relate to this program's deliverables. Representatives can provide technical guidance and submission templates, and will help to ensure the required commissioning deliverables of the program are included in the project team's scope of work.

Functional testing ensures that installed equipment is operating to the specified operating parameters outlined in the building's specifications. Functional testing evaluates the dynamic function and operation of equipment and systems using manual or automated monitoring methods. Systems are tested under various modes, such as during low and high heating or cooling loads, component failures, unoccupied periods, varying outside air temperatures, fire alarm periods, power failures, and so on.

Functional testing reports are submitted to Efficiency Manitoba to ensure all energy-related systems have been tested as per the program's requirements. Reports will be verified against the OPR for completeness, however, Efficiency Manitoba will not be responsible for ensuring test results satisfy the requirements of any law, rule, specification, or contract.

When applicable, program representatives should be invited to participate and/or witness functional equipment tests as part of the review process and to offer any additional technical guidance or expertise.

New Buildings Program Systems Manual templates have been developed in consultation with ASHRAE Guideline 1.4-2014 Procedures for Preparing Facility Systems Manuals. To obtain a copy of the guideline, visit ashrae.org/home.



7. Operator Training

Intent of deliverable

The owner, operator, and other relevant personnel must receive appropriate training on the new building's operation. Training should follow the creation of the Systems Manual and inform the owner and operators how the building was designed to operate. There are a variety of effective training formats that can be used, as each building is unique and training can be adapted to its specific requirements. Some examples of training opportunities include: hands-on site demonstrations of proper equipment operation and maintenance, off-site learning, virtual technology, classroom work, or a facility walk-through. It is beneficial to keep records of the training sessions and training materials for both current and future staff.

Submission requirements

- Provide sign-off sheets and records of attendance along with descriptions of the training activities pertaining to the content referenced in the building's Systems Manual; or
- Invite program representative(s) to participate in one or several operator training sessions, as part of the review process, to offer additional technical guidance or expertise, and to ensure the program's operator training deliverables have been met.

Additional information

Even buildings with the most ambitious targets for energy efficiency can consume excessive amounts of electricity and natural gas if they are not operated and maintained properly. Designs are complex and require extensive training to ensure building owners and operators are familiar with systems, equipment, and maintenance activities.

Along with a complete demonstration of the building's systems and equipment, operator training should follow the layout of the Systems Manual to review the following:

- The Systems Manual — including its location on-site and the documents referenced within the manual;
- Facility design and construction;
- Facility, systems, and assemblies information;
- Facility Guide/operations;
- Final commissioning report.



8. Program debrief and building operations meeting (Optional)

Intent of deliverable

After the project is completed and all program deliverables have been created and submitted appropriately, a debrief meeting will be scheduled with the building's operations staff and program representatives. The building owner, commissioning agent and other interested and relevant project team members are welcome and encouraged to attend as well.

This meeting gives the program representative the opportunity to receive an overview of the building's early operations. It also provides a chance to finalize outstanding issues, share feedback, and discuss any lessons learned throughout the project. This meeting will also serve as an important occasion to ensure the building's operations staff and building owner are familiar with the Systems Manual and can begin discussing energy management strategies, as well as implementing measurement and verification plans.

Submission requirements

A debrief meeting will be scheduled with the building's operations personnel and building owner to confirm all program deliverables have been met and the Systems Manual has been delivered.

Additional information

Depending on the level of involvement from Efficiency Manitoba representatives throughout the project (and depending on the size, complexity and location of the building) a separate debrief meeting may not be required or feasible. Be sure to contact a New Buildings Program representative and arrange for a commissioning overview meeting well before construction completion to verify the specific requirements for your project.



9. Occupancy permit

Intent of deliverable

The occupancy permit assures Efficiency Manitoba that the new building has been designed and constructed to meet or exceed applicable building codes and regulations.

Submission requirements

A copy of the building's occupancy permit(s), as issued by the Province of Manitoba, City of Winnipeg, or appropriate municipality or authority having jurisdiction, must be submitted.

Note: Efficiency Manitoba assumes no responsibility regarding the building owner's adherence to local building codes and regulations. Please see the liability section of the agreement on the original application for further details.

Additional information

Temporary or partial occupancy permits will be accepted on a case-by-case basis. If a copy of an occupancy permit cannot be reasonably procured (due to cost or other issues) a photograph of the issued permit will be accepted.

FINAL APPROVAL AND INCENTIVE PAYOUT

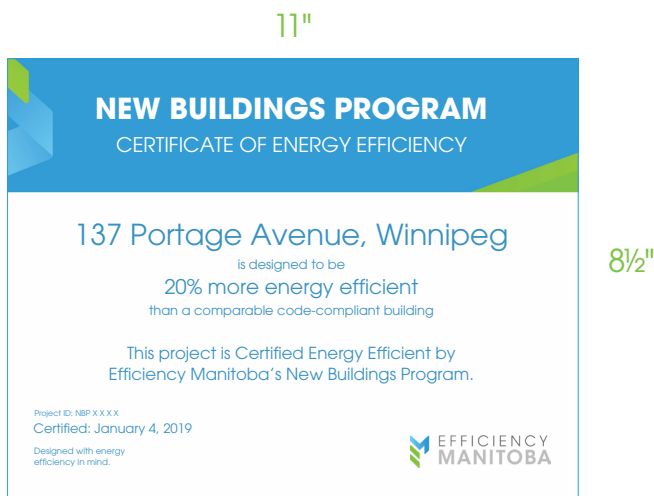
After construction and once all of the aforementioned deliverables have been reviewed and approved, the project will be deemed complete and the applicable incentives paid to the building owner. The final incentive amount will be calculated based on the final, approved energy model submission.

The building will be officially certified energy efficient if the minimum energy performance is met (at least 10% better than the MECB). If certification is awarded, the building owner will receive an official certificate from Efficiency Manitoba to commemorate the achievement in energy efficient building design.

Signage and recognition

Once a building's construction begins, Efficiency Manitoba will provide on-site signage to promote the building's energy efficient design targets.

If a building is awarded an energy efficiency certification, Efficiency Manitoba will provide a certificate and offer to produce an information sheet on the project, which may be used for a media release, to further assist with the promotion and recognition of the building owner's dedication to energy efficient building design and environmental leadership.



ADDITIONAL LIGHTING AND ELECTRICAL POWER REQUIREMENTS FOR NEW CONSTRUCTION PROJECTS

General lighting requirements

The building's lighting system will consist only of high performing LED lighting products verified by DesignLights Consortium (designlights.org), ENERGY STAR certified lighting products (energystar.gov/products/lighting_fans), or products approved independently by an Efficiency Manitoba Business Lighting Program engineer.

Lighting systems within a residential space (eg. in-suite lighting) that are not within the scope of the MECB and are not contributing to the building's modelled energy performance are not required to meet the performance standards listed above.

Parking lot electrical service

Receptacles provided for vehicle block heater and/or interior warmer service must be automatically controlled to reduce energy consumption during milder weather.

The controller must vary the amount of energy delivered to the receptacles based on outside air temperature. No power shall be delivered to receptacles when the outside air temperature is above -5°C . As the outside air temperature drops below -5°C , the power delivery on-time shall increase from 10% on-time to 100% on-time at -25°C and colder.



ADDITIONAL RESOURCES

American National Standards Institute (ANSI)

ansi.org

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

ashrae.org

BC Hydro Building Envelope Thermal Analysis (beta) Guide

bchydro.com/content/dam/BCHydro/customer-portal/documents/power-smart/builders-developers/final-mh-bc-part-1-envelope-guide.pdf

Building Commissioning Association

bcxa.org

Canada Green Building Council

cagbc.org

Canadian Standards Association (CSA)

csagroup.org

City of Winnipeg – Adoption of the National Energy Code (2011)

winnipeg.ca/ppd/pdf_files/InformationBulletins/2014/2014-014-ABEMPS.pdf

Green Globes Design: Environmental Assessment for New Buildings

greenglobes.com

Illuminating Engineering Society of North America (IES)

iesna.org

International Green Construction Code

iccsafe.org

Efficiency Valuation Organization - International Performance Measurement and Verification Protocol (IPMVP)

evo-world.org

Manitoba Office of the Fire Commissioner

firecomm.gov.mb.ca

National Energy Code of Canada for Buildings 2011 (NECB 11)

nationalcodes.nrc.gc.ca/eng/necb/index.shtml

National Fenestration Rating Council

nfrc.org

Natural Resources Canada – Office of Energy Efficiency: Energy Efficiency Regulations

<http://oee.nrcan.gc.ca>

North American Insulation Manufacturers Association

naima.org

The Green Building Policy for Manitoba Government Funded Projects

gov.mb.ca/mit/greenbuilding

The Heating, Refrigeration and Air Conditioning Institute of Canada (HRAI)

hrai.ca

Manitoba Hydro Commercial Service Application

hydro.mb.ca/accounts_and_services/services_and_lighting/business/service_application_commercial

APPENDIX A: ENERGY MODELLING ASSISTANCE INCENTIVE

Overview

An incentive of up to \$10,000 is available to eligible building owners who submit a completed design energy model report to Efficiency Manitoba during the project's design phase and then successfully complete the program's Performance Path.

Using energy modelling early in a new building's design process can help identify opportunities for energy efficiency, and can reduce the need for costly modifications and change orders later on in the project. Energy models can simulate a variety of building details, such as roof and wall construction, lighting power densities, domestic hot water usage, heating and ventilation systems, occupancy schedules, and more. Changing variables, such as outdoor and indoor temperature, solar orientation, humidity, energy costs, construction materials, and occupant levels allow the energy modeller to come up with many different scenarios and optimize a building's design to meet energy efficiency objectives.

Design energy model reports will be reviewed for program compliance and, wherever possible, Efficiency Manitoba will collaborate with the project's energy modeller to discuss potential energy efficiency opportunities and building design enhancements.

Financial incentives

The energy modelling assistance incentive provides up to \$10,000 to project teams using energy modelling during the design of a new construction project. Up to \$5000 will be paid upon approval of the design energy model report and the remaining will be paid upon successful completion of the Performance Path. The total energy modelling assistance incentive is the lesser of \$10,000 or the total value of the invoice(s) for energy modelling services.

A detailed copy of the invoice(s) itemizing the total cost of energy modelling services must be provided to Efficiency Manitoba. The energy modelling assistance incentive will not exceed the amount of the invoice(s).

How to participate

1. Complete an energy modelling assistance incentive application form. Forms are available at efficiencymb.ca/NewBuildings
2. A New Buildings Program representative will review the form and, if accepted, will notify the building owner, energy modeller, and owner's representative via email.
3. A design energy model report along with any relevant reports generated by the energy modelling software program must be submitted to Efficiency Manitoba before the project's tender date and before the project is issued a building permit*. See the following page for requirements of the design energy model report submittal and the energy modelling software-generated reports.
4. An invoice for the applicable energy modelling services must be provided to Efficiency Manitoba. The invoice can be provided directly from the energy modeller, the building owner, or other project contractor or sub-contractor.
5. Once the design energy model report is reviewed and deemed complete, the incentive will be processed and sent to the building owner. Any remaining energy modelling incentive assistance monies (up to a total of \$10,000) will be provided upon completion of the program's Performance Path.

*A foundation permit does **not** render a project ineligible. The construction of foundation and structural elements may begin as these elements do not typically have a significant impact on the energy efficiency of a new commercial building.



Energy modelling software requirements

The energy model must be primarily created with energy modelling software that meets the requirements of the National Energy Code of Canada for Buildings 2011 – Part 8: Building Energy Performance Compliance Path. Copies of the building code are available online at nrc-cnrc.gc.ca/eng/publications/codes_centre/2011_national_energy_code_buildings.html.

Design energy model report submittal requirements

The design energy model report must include, but not be limited to, the following information:

- Project description/building overview
- Energy modelling scope
- Inputs and assumptions:
 - Climate data
 - Basis of inputs (proposed and reference cases)
 - Key assumptions
 - System workarounds
- Results and discussions:
 - Energy end-use breakdown (proposed and reference cases)
 - Energy utilization intensity (EUI) comparison between proposed and reference cases
 - Thermal energy demand intensity (TEDI) comparison between proposed and reference cases
 - Annual energy consumption comparisons (split by fuel type and expressed in kilowatt-hours (electric) and cubic meters (natural gas) and totalled)
 - Estimated annual energy cost comparisons (split by fuel type and expressed in kilowatt-hours (electric) and cubic meters (natural gas) and totalled)
 - Discussion of results, providing commentary on the end-use energy savings
 - Supplemental reports
 - Provide any relevant reports and results files generated by the energy modelling software program. These output documents typically include detailed information on: modelled envelope assemblies, ventilation values (eg ASHRAE 62.1 inputs), lighting specifications, process and plug load details, zone heating & cooling loads, and hourly schedules.
- Conclusions and recommendations
- Appendix A: Detailed summary of modelling inputs



Eligibility

- The Building Owner must be a Manitoba Hydro customer eligible for the General Service Electricity Rate.
 - This Program applies to new construction projects classified as Part 3 buildings that are required to follow the Manitoba Energy Code for Buildings 2013 (MECB), as determined by the Authority Having Jurisdiction. Commercial buildings not required to follow the MECB may also apply; however, Residential, Multi-Unit Residential, Farm, Industrial, and Manufacturing buildings that are not required to follow the MECB are not eligible for this Program.
 - The Applicant must be the current registered owner of the property for the building and of the building.
 - Incentives are not available for projects completed as of the date Efficiency Manitoba approves this Application.
 - To be eligible for Energy Modelling Assistance Incentive, a design energy modelling report **must be submitted to Efficiency Manitoba before the project's tender date and before the project is issued a building permit.** A detailed copy of the invoice(s) itemizing the energy modelling services must be provided to Efficiency Manitoba. The energy modelling assistance incentive will not exceed the amount invoiced to the building owner.
 - Customers must complete and submit all deliverables as outlined in the New Buildings Program 2.2 - Performance Path Program Guide (Appendix A).
- The Building Owner must at all times comply with all applicable federal, provincial, municipal, laws, by-laws, regulations, and codes, which are, or may hereafter become, applicable, to the Building Owner, the building (including, without limitation, its design, construction, operation), the project and/or any of the team member(s) or other contractor(s), and with all requirements of Efficiency Manitoba relating to the Program, Application, Incentive, Incentive Agreement, energy supply and/or account(s).
 - Efficiency Manitoba must be promptly notified of any change to the building's design at all times, otherwise the project may be determined by Efficiency Manitoba to be ineligible for any Incentives.
 - Failure to qualify for the Energy Modelling Assistance Incentive **does not affect eligibility** for the remaining New Buildings Program financial incentives or energy efficiency certification.

If you have any questions or require assistance, contact us directly at **newbuildings@efficiencymb.ca** or **204-944-8181**.

efficiencymb.ca/newbuildings

**FOR THE MOST CURRENT VERSION OF THIS
DOCUMENT ALONG WITH SUPPLEMENTAL
PROGRAM INFORMATION AND APPLICATION
FORMS, PLEASE VISIT:**

efficiencymb.ca/newbuildings

or contact us at:

NewBuildings@efficiencymb.ca

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Winnipeg: 204-944-8181

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