



Better Buildings BC Program Manual

November 2018



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1 Executive Summary

Better Buildings BC is a competitive provincial incentive program (the “Program”), developed and managed by the Province of British Columbia as represented by the Minister of Mines, Energy and Petroleum Resources (the “Province”) and administered by Integral Group Consulting (BC) LLP (“Integral Group” or “Program Administrator”).

The aim of the Program is to support, promote and celebrate the design and construction of low-carbon, net-zero energy-ready (“NZER”) buildings. Supported by Provincial funding, the Program will provide incentives for the design and construction of multi-family, commercial, and institutional buildings that achieve the highest level of performance of the [BC Energy Step Code](#). Buildings targeting Passive House are also covered under the program. Successful Applicants (defined below) will be celebrated as leaders in innovative building design in British Columbia, and showcased to the building industry and the public as best practices in low-carbon, energy efficient design.

All new Part 3 construction projects and major building renovations are eligible to participate in the Program. It is expected that developers, architects, and/or engineers will be responsible for submitting Expressions of Interest, and if applicable, Program Applications (terms defined below). However, all members of a given design team, including the project owner, must be made aware of the submission(s).

Interested parties will be required to submit an expression of interest in the form attached as Appendix A (an “Expression of Interest” or “EOI”) by November 30th, 2018. EOIs will be reviewed for completeness and eligibility by the Program Administrator and evaluated using key criteria by the Chairs of the technical review panel (“Technical Review Panel” or “TRP”; see Section 6).

Interested parties with eligible EOIs that pass the preliminary evaluation by the TRP Chairs (“Participants”) will receive an incentive (the “Design Incentive”) to help cover any additional costs associated with the design of a NZER building. Design Incentives have been established by building area according to the following breakdown:

Building Area	Design Incentive Amount
Under 5,000m ²	• \$3.50/m ²
5,000m ² – 9,999m ² (per additional m ²)	• \$1.60/m ²
10,000m ² – 24,999m ² (per additional m ²)	• \$0.80/m ²
Over 25,000m ² (per additional m ²)	• \$0.40/m ²

Design Incentives will be capped at a maximum of \$40,000 per project.

To be receive the Design Incentive, Participants must:

- a. Complete and submit an Expression of Interest to the Program Administrator no later than 11:59pm on November 30th, 2018;
- b. Receive a completeness check and eligibility signoff by the Program Administrator;
- c. Pass the evaluation conducted by the Technical Review Panel Chairs.

Projects that make significant use of wood products in their design and construction and that did not receive a Design Incentive in the initial round of evaluation will be eligible for an incentive of the same value provided by Forestry Innovation Investment.

Participants who receive a Design Incentive will be required to submit a full Program Application in the form attached as Appendix B (a “Program Application”) no later than 11:59pm on March 30th, 2019, including:

- A description of the project’s energy conservation measures and design strategies;
- Energy modelling results and associated documentation;
- An airtightness testing plan;

- A costing report summarizing total project costs;
- A measurement and verification report that indicates the building metering strategy; and
- Schematic drawings and renderings to indicate relevant design strategies, including the air barrier strategy.

Program Applications will be subject to a full evaluation by the TRP, as more fully described in Section 6 of this Manual. The TRP will evaluate, score and rank Program Applications (“Ranked Applications”) based on technical performance, cost-competitiveness, and replicability as detailed in the Program Manual. Ranked Applications will be further reviewed and scored by a project selection committee (the “Selection Committee”) for their ability to meet additional social and environmental goals, and overall design aesthetic. From and based on their review and evaluation of the Ranked Applications, the Selection Committee will recommend a set of successful applicants (the “Successful Applicants”) to the Province for final determination.

Successful Applicants will receive the *Net-Zero Energy-Ready Incentive* (the “NZER Incentive” and, together with the Design Incentive, the “Incentives”). NZER Incentive amounts have been set to help cover the estimated cost premiums associated with the design and construction of a net-zero energy-ready building. They are as follows:

Building Type	NZER Incentive Amount
Low-Rise multi-family	• \$60/m2 to a maximum of \$100,000
High-Rise multi-family	• \$80/m2 to a maximum of \$350,000
Office	• \$10/m2 to a maximum of \$250,000
Retail	• \$40/m2 to a maximum of \$175,000
Institutional	• \$25/m2 to a maximum of \$350,000

To receive the NZER Incentive, Participants must:

- Submit a Program Application no later than 11:59pm on March 30, 2019;
- Be selected as a Successful Applicant by the Selection Committee and the Province;
- Submit the final permit prior to occupancy, as required by the authority having jurisdiction;
- Submit a final energy model and airtightness testing results to the Program Administrator; and
- Agree to subject the building to the M&V process as described in Section 8 of this Program Manual.

Projects that make significant use of wood products in their design and construction and that did not receive an NZER Incentive in the initial round of evaluation may be eligible for an incentive of the same value provided by [Forestry Innovation Investment](#).

Successful Applicants will be required to design their project and submit information that allows for the measurement and verification of the project’s energy performance, as more fully described in Section 8 of this Manual. Successful Applicants will also be asked to submit supplementary materials at construction and occupancy to assist in the identification of the key building strategies and insights necessary to achieve NZER buildings.

2 Better Buildings BC: Program Summary

The Program has been designed to advance industry and government experience and expertise in net-zero energy-ready construction, and raise awareness of net-zero energy-ready buildings among the public. A net-zero energy-ready building is defined as one that has been designed and built to a level of performance such that it could, with the addition of solar panels or other renewable energy technologies, achieve net-zero energy performance. In addition to achieving net-zero energy-readiness, the Program has been designed to showcase buildings from across the Province that are designed to achieve and maintain low greenhouse gas emissions intensity.

The [BC Energy Step Code](#) has been designed such that the highest level of performance that can be reached for each applicable building type is on par with the achievement of a net-zero energy-ready building. As such, the intent of this Program is to familiarize the BC building industry with the technologies, tools, and strategies necessary to construct Part 3¹ buildings to the highest level of the BC Energy Step Code. While the achievement of the highest step of the BC Energy Step Code requires significant increases in building energy efficiency, the overall goal of the Program is to showcase those building designs that are able to meet these requirements using both innovative and cost-effective strategies.

Eligible building archetypes include all low-rise and high-rise residential, commercial office, and institutional buildings that fall under Part 3 of the BC Building Code. Only projects that are designed to achieve the highest level of the BC Energy Step Code (see Table 1) or Passive House are eligible to participate. Applications from across the province and from all climate zones are encouraged to apply.

Table 1: BC Energy Step Code requirements for Part 3 buildings seeking net-zero energy-ready levels of performance²

Highest Energy Step Code Level	Energy Modelling & Airtightness Testing	Thermal Energy Demand Intensity Target (kWh/m ² .year)	Total Energy Use Intensity Target (kWh/m ² .year)
Multifamily Residential (MURB)			
Step 4	Required	15	100
Commercial/Retail (Group D & E)			
Step 3	Required	20	120

Award of funding will go to submissions that meet a number of additional criteria, including greenhouse gas emissions reductions, replicability, cost-effectiveness, overall aesthetic, and social and environmental benefits. Successful Applicants will be required to design their project to allow for the measurement and verification of the project's energy performance (see Section 8).

2.1 Purpose of this Manual

This Manual has been prepared to provide interested parties with a guide and overall reference for the Program. The Manual provides information on the following:

- Overall Program requirements, procedures, and timelines

¹ Part 3 Buildings are buildings classified as Group A, B or F-1, or exceeding 600 m² in building area or exceeding three storeys in building height and have major occupancies. Group C (residential), Group D (office/service), Group E (retail), or Group F-2, F-3 (medium- and high-hazard industrial).

² Note that these targets have been developed for Climate Zone 4, but are expected to be made available across the Province by December 2018. Additional targets for hotel/motel archetypes and new targets for Commercial Office buildings are also expected to be approved in December 2018.

- How to determine Program eligibility
- How to qualify for Program incentives
- Terms and conditions of Program participation

2.2 Program Funding and Administration

The administration of the Program has been designed to ensure that standards of fairness and professional responsibility are upheld. Below, the roles and responsibilities of key actors to be involved in the design and administration of the competition are presented.

Program Funder: Province of British Columbia as represented by the Minister of Energy, Mines and Petroleum Resources

The Electricity and Alternative Energy Division of the Province has provided program funding for program design, administration, and incentive disbursements via the BC Innovative Clean Energy (ICE) Fund. The Province will oversee and approve all Program components and is responsible for making the final decision on all Successful Applicants.

Program Co-Funder: Forestry Innovation Investment

Forestry Innovation Investment (FII) has provided additional funding to encourage and support projects using wood-based design and construction methods.

Program Design and Administration: Integral Group

Integral Group has been appointed as the primary contractor in the design and administration of the Program. Integral Group will act as the primary contact point for all interested parties and Participants and will ensure that all Incentives are disbursed in a timely fashion. Integral Group is not precluded from participating in projects that submit an Expression of Interest or a Program Application.

Advisory Panel

An advisory panel was created to provide a critical eye on overarching Program design and to ensure the technical and financial feasibility of the Program. Advisory panel members include:

- Akua Schatz, Canada Green Building Council
- Antje Wahl, Forestry Innovation Investment
- Bertine Stelzer, BC Hydro
- Bill MacKinnon, BC Housing
- Christian Cianfrone, Zero Emissions Building Centre of Excellence
- Dave Ramslie, Integral Group
- Jeff Fisher, Urban Design Institute
- Jennifer Cutbill, Royal Architectural Institute of Canada
- Jenelle Anderson, Fortis BC
- Oscar Ceron, BC Hydro
- Sean Pander, City of Vancouver
- Tom-Pierre Frappé-Sénéclauze /Betsy Agar, Pembina Institute

Technical Review Panel

The Technical Review Panel is responsible for evaluating all Expressions of Interest and full Program Applications for technical performance. The TRP will develop a set of Ranked Applications based on technical performance, cost-competitiveness, and replicability. Technical Review Panel members include:

- Christian Cianfrone, ZEBx
- Zac May, Province of BC
- Curt Hepting, EnerSys
- Kamilia Vaneck, WSP in Canada
- Graham Finch, RDH Building Science
- Andrew Peel, Peel Passive House Consulting
- Stuart Hood, Integral Group
- Matt Younger, AME Consulting Group
- Neill McGowan, BTY Group
- Angela Lai, Core Two
- Sukh Johal, Wood WORKS! BC

Selection Committee

The Selection Committee is responsible for reviewing and scoring Ranked Applications received from the TRP. for their ability to meet additional social and environmental goals, and overall design aesthetic. From and based on their review and evaluation, the Selection Committee will recommend a set of Successful Applicants to the Province for final determination.

Measurement & Verification Team: Integral Group

The Measurement & Verification (M&V) Team is responsible for conducting all M&V processes after occupancy. This includes retrieval and analysis of the building's metered energy usage data. The M&V Team will prepare reports summarizing this analysis and comparing actual and predicted energy performance.

2.3 Contact Information

Questions on all matters related to the Program may be directed to info@betterbuildingsbc.ca.

Program Administrator

Lisa Westerhoff, Integral Group

Province of BC

Andrew Pye, Province of BC

3 Overview of Program Phases and Requirements

Phase	Actions and Deliverables	Timeline
Launch		October 10th, 2018
Confirming Eligibility	<p>Applicant Actions:</p> <ul style="list-style-type: none"> • Interest parties submit an Expression of Interest to Program Administrator <p>Program Administrator Actions:</p> <ul style="list-style-type: none"> • Program Administrator reviews Expressions of Interest for eligibility and completeness • Program Administrator will provide interested parties who submitted incomplete Expressions of Interest with an opportunity to correct deficiencies • Technical Review Panel Chairs evaluate Expressions of Interest to identify Participants who will receive the Design Incentive • Program Administrator notifies and requests submission of Full Program Application from Participants, and distributes Design Incentives 	<p>EOI Form due November 30th, 2018, 11:59 pm</p> <p>Confirmed Participants notified December 21st 2019</p>
Program Application	<p>Applicant Actions:</p> <ul style="list-style-type: none"> • Participants develop and submit Program Application <p>Program Administrator Actions:</p> <ul style="list-style-type: none"> • Program Administrator reviews Program Applications for deficiencies and provides Participants who have submitted deficient Program Applications with an opportunity to correct deficiencies • Program Administrator forwards completed Program Applications to Technical Review Panel 	Full Program Application due March 30th, 2019 11:59 pm
Technical Review	<p>Applicant Actions:</p> <ul style="list-style-type: none"> • None <p>Program Administrator Actions:</p> <ul style="list-style-type: none"> • Technical Review Panel evaluates, scores and ranks applications, and submits Ranked Applications into Summary Reports for the Selection Committee 	Technical Panel Review completed by April 30th, 2019
Selection Committee Review	<p>Applicant Actions:</p> <ul style="list-style-type: none"> • None <p>Program Administrator Actions:</p> <ul style="list-style-type: none"> • Selection Committee reviews and scores Ranked Applications and recommends a set of Successful Applicants to the Province of British Columbia for final determination 	Selection Committee Review completed by May 31st, 2019
Final Selection	<p>Applicant Actions:</p> <ul style="list-style-type: none"> • Successful Applicants attend an Open House to showcase designs to media and industry peers <p>Program Administrator Actions:</p> <ul style="list-style-type: none"> • Minister of Energy, Mines and Petroleum Resources congratulates Successful Applicants. • Program Administrator delivers award plaques to Successful Applicants. • Program Administrator hosts an Open House to showcase designs to media and industry peers. 	June 2019
Occupancy	<p>Applicant Actions:</p> <ul style="list-style-type: none"> • Successful Applicants submit final permit prior to occupancy, final energy model, and airtightness testing results to Program Administrator • Successful Applicants share lessons learned via Program forms and a workshop event <p>Program Administrator Actions:</p> <ul style="list-style-type: none"> • Program Administrator verifies final documentation and issues NZER Incentives to Successful Applicants. 	2020 – 2023
12 months Post-Occupancy	<p>Applicant Actions:</p> <ul style="list-style-type: none"> • Successful Applicants' projects undergo Measurement and Verification (M&V) <p>Program Administrator Actions:</p> <ul style="list-style-type: none"> • A Program M&V Reviewer verifies and reports final building performance • Program Administrator/Province issues final Case Study Reports on building performance 	2021 – 2024

4 Eligibility

4.1 Project Eligibility

The following criteria must be met in order to qualify for the Program:

- 1) The project is located in the province of British Columbia;
- 2) The project is a new Part 3 construction project or a major building renovation³ of a Part 3 building;
- 3) An application (e.g. Rezoning, Development Permit) has been submitted to a municipality, and/or the project owner, or an affiliate (as defined in the *Business Corporations Act*) of the project owner, has secured title to the lands for the project in question or has entered into a binding agreement for the purchase of the lands for the project in question;
- 4) The project has not yet received a Building Permit.⁴

Projects that are located in the City of Vancouver and required to conform to the City of Vancouver's Zero Emissions Building Plan (ZEBP) are eligible to apply to the Program, on the condition that the highest tier of the ZEBP is being pursued.

4.2 Expression of Interest

The Program is open to all members of the building design and construction industry. There is no limit to the number of Expressions of Interest an individual owner, firm, design team, or consultant may participate in or submit.

Interested parties must demonstrate their eligibility and familiarity with high performance building construction via the submission of the Expression of Interest. Interested parties must also identify the suite of expected measures and strategies that will be used to achieve substantial energy performance outcomes and meet the requirements of the highest step of the BC Energy Step Code.

Expressions of Interest will be reviewed for completeness and eligibility (based on the criteria set out in section 4.1 above) by the Program Administrator. Details on all EOIs received will be reported to the Province, including a list of all parties involved and a clear explanation for any Expressions of Interest found to be ineligible and rejected. EOIs will be evaluated by the Technical Review Panel Chairs. TRP Chairs will review EOIs using the criteria in Table 2.

IMPORTANT:

Interested parties must submit their Expression of Interest to the Program Administrator no later than 11:59PM on November 30th, 2018.

All design team members, including the developer, should be made aware of the submission of an EOI.

The Expression of Interest can be found in **Appendix A**.

³ (BC Hydro) Major Building Renovations are defined as one of the following for which requires a building permits and certified buildings plans by a licensed professional.

- *Change of use and reconstruction of an existing building space or space within; or*
- *Change Construction work of a nature requiring the building or space within to be out of service for at least 30 consecutive days; or*
- *The renovations are worth at least 50% of the existing building's value and impact the building envelope.*

⁴ Projects must not have received or applied for a Building Permit at the time of submitting an Expression of Interest. However, projects that have received one at the time of full Program Application will still be eligible to participate in the Program.

Table 2: Evaluative Criteria for Eligibility

Criterion	Evaluation	
Energy and Emissions Performance	<ul style="list-style-type: none"> Does the interested party provide sufficient detail to demonstrate the design strategies necessary to achieve the targeted level of performance? Does the interested party provide details on how greenhouse gas emissions will be reduced? 	/10
Cost effectiveness/ Replicability	<ul style="list-style-type: none"> Is the project likely to achieve the BC Energy Step Code using cost-competitive design strategies? Is the project likely to impact the market in a significant way? 	/10
Applicant and Team Experience	<ul style="list-style-type: none"> Does the interested party and the design team have sufficient capacity and/or experience to meet the requirements of the BC Energy Step Code? Have design team members successfully designed high performance buildings in the past? 	/10
Overall Score		/30

4.3 Design Incentives

Participants will receive a Design Incentive to help cover any additional costs associated with the design of a NZER building. The Design Incentives have been established by building area according to the following breakdown:

Building Area	Design Incentive Amount
Under 5,000m ²	• \$3.50/m ²
5,000m ² – 9,999m ² (per additional m ²)	• \$1.60/m ²
10,000m ² – 24,999m ² (per additional m ²)	• \$0.80/m ²
Over 25,000m ² (per additional m ²)	• \$0.40/m ²

Design Incentives will be capped at a maximum of \$40,000 per project.

To be receive the Design Incentive, interested parties must:

- Complete and submit an Expression of Interest to the Program Administrator no later than November 30th, 2018;
- Receive a completeness check and eligibility signoff by the Program Administrator;
- Pass the evaluation conducted by the Technical Review Panel Chairs.

Projects that make significant use of wood products in their design and construction and that did not receive a Design Incentive in the initial round of evaluation will also be eligible for an incentive of the same value provided by Forestry Innovation Investment. To qualify for the wood-based projects incentive, the following criteria must be met *in addition to the criteria outlined in Table 2*:

- Demonstrate project replicability to promote and educate on wood’s potential in energy efficient construction.
- The main structural building system is wood or wood-hybrid (such as wood-concrete or wood-steel); and wood is used in three or more structural or related applications (e.g. beams, columns, walls, floors, elevator shafts, staircases), *OR* wood is the primary material used in the total building envelope structure.

All Participants who receive the Design Incentive will be required to submit a Full Program Application.

5 Submitting a Program Application

Participants will be required to submit a full Program Application that provides sufficient detail for the project's performance to be assessed by the Technical Review Panel. Participants must demonstrate that the project has been designed in such a way that the performance thresholds associated with the highest step of the BC Energy Step Code will be met. This includes the submission of the following documents:

- ✓ A complete **Application Form**
- ✓ An **Energy Modelling Report** detailing all key assumptions and energy performance outcomes
- ✓ Relevant **Output Files and Supporting Documentation** to support the Energy Modelling Report
- ✓ An **Airtightness Testing Plan** that shows when and how the building's airtightness will be confirmed
- ✓ A **Costing Report** that indicates the building's estimated total cost
- ✓ A **Measurement and Verification Plan** that indicates the building's metering strategy
- ✓ A set of **Drawings** that show the building's air barrier strategy
- ✓ A set of **Renderings** to visually illustrate the project's design

5.1 Application Form

Participants shall complete and submit a full Program Application providing key project details, projected performance outcomes, and energy efficiency design strategies. Program Applications must be submitted to the Program Administrator, who will review them for completeness. The Program Administrator will notify any Participant whose Program Application is found to be incomplete and offer an opportunity to provide any required information. Any Program Applications that are ultimately rejected due to incompleteness will be reported to the relevant Participant and to the Province, including details on the rationale for rejection.

Any substitutions on the design team from the original Expression of Interest must be reviewed and approved by the TRP Chair prior to full evaluation of the Program Application by the TRP.

IMPORTANT:

Participants must submit their Program Application form to the Program Administrator no later than 11:59PM on March 30th, 2019.

All members of the design team, including the project owner, must be made aware of the submission of a Program Application.

The Program Application can be found in **Appendix B**.

5.2 Energy Modelling

All projects shall complete an energy model and summarize the results in the Energy Model and Energy Checklist sections of the Program Application found in **Appendix B**.

5.2.1 Energy Modelling Guidelines

All projects shall be modelled in accordance with the BC Energy Step Code requirements as noted in the British Columbia Building Code Regulation, which requires conformance with:

1. Applicable requirements of Part 8 of the National Energy Code of Canada for Buildings (NECB)
2. City of Vancouver's [Energy Modelling Guidelines](#).

All values should be reported in metric units.

5.2.2 Definitions

All project energy use metrics are defined in accordance with the Energy Step Code sections of the British Columbia Building Code Regulation or the City of Vancouver's Energy Modelling Guidelines.

Total Energy Use Intensity (TEUI): Energy used over a year, normalized per square meter of floor area of conditioned space and expressed in kWh/m².year

Thermal Energy Demand Intensity (TEDI): Annual heating required by the building for space conditioning and for conditioning of ventilation air, normalized per square meter of floor area of conditioned space and expressed in kWh/m².year

Greenhouse Gas Intensity (GHGI): The total greenhouse gas emissions associated with the use of all energy utilities on site, using the emissions factors provided by the City of Vancouver Energy Modeling Guidelines.⁵

5.2.3 Acceptable Energy Modelling Software

Acceptable modelling software include the following:

- DOE base software such as (EE4, DOE-2, eQuest, Visual DOE, EnergyPro, etc.)
- IES-VE
- HAP
- PHPP (for Passive House applications)

The use of alternative software may be accepted but must be approved by the Program Administrator prior to submitting a Program Application.

5.2.4 Output Files and Supporting Documentation

Participants must submit the following model output files in addition to the energy model summary:

- Total annual energy use with end use breakdown
- Total annual energy cost with end use breakdown
- Envelope performance
- System Design Parameters
- Equipment specifications
- Plant Design Parameters
- Summary of Spaces
- Unmet load hours

Additional documentation may be appended to support the energy model summary at the applicant's discretion.

5.2.5 Applications Seeking Passive House Certification

Where Participants are pursuing Passive House certification, the following will be accepted in lieu of the above output files.

- The project's completed PHPP spreadsheets
- A Passive House Design Summary report that details critical assemblies, components, and strategies.
- The name, contact and credentials of the Certified Passive House Designer, or Certified Passive House Consultant, who is approved by the Passive House Institute and who will document and verify construction to plan.

⁵ While GHGI thresholds have not been included as a requirement of the BC Energy Step Code, Participants will be required to report their project's modelled GHGI.

5.3 Airtightness Testing Plan

Participants must submit an airtightness testing plan that includes the following components:

- The contact information of the contractor that has been retained
- Details on when the test will occur in the construction schedule
- How the test will be performed (e.g. whole building vs. floor by floor)

5.4 Costing Report

Participants must demonstrate costs both in the form of capital costs and long-term costs (i.e. life cycle costs). Participants must provide a completed costing report summarizing the following information:

- The name and contact details of the qualified Quantity Surveyor or other qualified individual who has prepared the Costing Report
- Direct construction costs in an elemental summary consistent with either the Canadian Institute of Quantity Surveyors (CIQS) Elemental Cost Analysis Format OR Uniformat, as issued by Construction Specifications Canada (CSC) for both the proposed project and a comparable baseline built to the BC Building Code
- Incremental Cost Differential between the base case and proposed case in an elemental summary consistent with the CIQS or CSC. The project baseline is determined on a case by case basis according to today's industry standard. The baseline is assumed to be the latest technology equivalent for the described level of service and be in compliance with the base BC Building Code. Changes to legislation may affect the recognized baseline for a given energy measure. Projects located in jurisdictions that require compliance above the base BC Building Code should use base BC Building Code to develop the incremental cost differential. Local compliance requirements will be noted in the program application form.
- Operating Costs
 - Annual utility (energy and water) costs for both the proposed project and the baseline
 - Estimated annual common area life cycle costs (annual maintenance and repairs) for both the proposed project and the baseline (residential projects).
- Life Cycle Costs
 - Net Present Value (real discount rate 5%, assessment period 30 years)
 - Simple Payback for each energy conservation measure under consideration.

5.5 Measurement & Verification Plan

Participants are required to submit a Measurement and Verification (M&V) Plan for review and implementation by the Better Buildings BC Program M&V Reviewer. The purpose of the M&V Plan is to demonstrate that sufficient metering has been included into the design to satisfy program M&V requirements as per Section 8 of this Program Manual. The M&V Plan will provide details on the project's metering strategy that will allow an understanding of the building's final energy performance, and is to include, at a minimum, the following elements:

- a. A description of the metering system start-up, commissioning and verification process;
- b. A clear and detailed description of the M&V boundary (or boundaries) as related to project building occupancy(ies), Modelled Floor Area (MFA) or excluded energy end uses (e.g. electric vehicle charging stations);
- c. A detailed description of the relationship and correlation between sub-metered systems, modelled energy end-uses, City of Vancouver modelling parameters, and relevant BC Energy Step Code targets; and
- d. The Meter Schedule.

5.6 Drawings

Participants must provide a full set of schematic designs that clearly indicate the following:

- The building's air-tightness strategy; i.e.

- A red line drawing indicating the uninterrupted air barrier;
 - An indication of any risks of interruptions in key envelope details, e.g. balconies, slab edges, parapets, window mounting details)
- All floor plans, sections, elevations, and assemblies (floor, wall, roof)
- A site plan
- Key window details (sill, jamb, head), floor/wall junctions, and wall/roof junctions showing all air barrier connections and approaches to mitigating thermal bridges
- Mechanical and electrical design strategies, including major system components

5.7 Renderings

Participants must provide a set of renderings including a minimum of:

- Two primary elevations
- Two 3D building views
- One 3D street level view

6 Technical Review of Program Applications

6.1 Technical Review Panel

The purpose of the Technical Review Panel is to provide a comprehensive review and evaluation of Program Applications, and to provide an assessment of those Program Application and determine the Ranked Applications, to assist the Selection Committee in selecting the Successful Applicants who will receive the *NZER Incentive*.

The TRP consists of a team of experts with demonstrated experience and success in modelling, designing, and realizing high performance, energy efficient, and net-zero energy-ready projects. Technical Review Panel members are primarily responsible for reviewing all Program Applications for their ability to meet the highest step of the BC Energy Step Code.

More generally, the TRP's role is to provide support and guidance to the Program Administrator, Selection Committee, and the Province on the technical feasibility, cost, constructability, and likely success of achieving the desired performance outcomes, including potential issues that could arise from the project's design (e.g. potential cost overruns, overheating, occupant discomfort, etc.). Together with administrator support from Program Administrator, they are responsible for submitting clear documentation including recommendations to the Selection Committee to assist the Selection Committee in making any final decision on a Participant's receipt of an NZER Incentive.

6.2 Technical Review Process

Program Applications will be subject to a full evaluation by the TRP to determine the likelihood that they will meet the requirements of the highest step of the BC Energy Step Code. The TRP will develop a set of Ranked Applications based on technical performance, cost-competitiveness, and replicability. Each Program Application will receive a review by a mechanical engineer, an envelope specialist, an energy modeller, and cost consultant who is not involved with the project under review. TRP members will be required to assess the merits of the application based on a number of criteria pertaining to energy and emissions performance, cost competitiveness, and replicability (see Table 3). A neutral Chair will moderate and approve the final set of Ranked Applications before they are passed on for further review by the Selection Committee.

6.3 Conflict of Interest

To avoid any potential conflicts of interest, the Program Administrator and the TRP Chair will ensure that all Participants' identifying information is removed prior to its submission to the TRP. Program Applications will be managed using an Excel program and assigned a code to ensure their anonymity prior to submission to the TRP. All technical results will be compiled into a template for Selection Committee Summary reports that minimize the potential for bias. The Program Administrator will be responsible for ensuring that TRP members are not involved with any project that they review.

The TRP has been assembled in such a way as to ensure projects may be reviewed by a sufficient number of TRP members that are not directly or indirectly involved with their design or project. Program Applications will be distributed by the neutral Chair to each member of the TRP to ensure that Program Applications are reviewed by a member of the TRP who has not been involved in the project under evaluation. In the event that a member of the TRP is later found to be directly or indirectly involved with a project under evaluation, he/she will be required to recuse him or herself and a replacement member with a similar set of skills and expertise will be identified and added to the TRP for the purposes of considering that project.

All final decisions on conflicts of interest will be made by the neutral Chair.

Table 3: Criteria for Technical Review

Criterion	Evaluation	Relevant Application Components	Score
Energy and Emissions Performance	<p>Are energy modelling results realistic, based on the design?</p> <p>Does the building's design strategy pose any risks that may threaten the achievement of the Energy Step Code targets?</p> <p>Is the project likely to meet either the highest step of the Energy Step Code or Passive House?</p> <p>Is the project likely to achieve and maintain significant greenhouse gas emission reductions?</p>	<ul style="list-style-type: none"> ✓ Application Form ✓ Energy Modelling Report ✓ Output Files & Supporting Documentation ✓ Schematic Drawings 	/40
Cost-Competitiveness	<p>Does the project showcase the BC Energy Step Code using cost-competitive design strategies?</p> <p>Is the premium associated with the project's design reasonable and/or acceptable?</p> <p>Do design strategies provide a durable building with low maintenance needs, long replacement cycles, and reduced reliance on active systems?</p>	<ul style="list-style-type: none"> ✓ Application Form ✓ Costing Report ✓ Schematic Drawing ✓ Renderings 	/20
Replicability	<p>Does the project make use of currently available building techniques and materials?</p> <p>Does the design illustrate design strategies that can be used in other locations with similar climatic conditions?</p> <p>Does the project make use of a design strategy that is likely to impact the market in a significant way?</p>	<ul style="list-style-type: none"> ✓ Application Form ✓ Costing Report ✓ Schematic Drawing ✓ Renderings 	/10
Total Score	<p>Does the project meet the eligibility requirements for the bonus incentive for wood-based designs?</p> <p>Taking into account all of the above, please assign a score to the Program Application</p>	<ul style="list-style-type: none"> • Score to be averaged among reviewing members of the TRP 	/70

7 Selection Committee Review

7.1 Selection Committee

The Selection Committee's primary role is to decide the set of Successful Applicants that will receive the NZER Incentive. The Selection Committee will receive technical guidance from the Technical Review Panel, and report their findings to the Program Administrator and the Province.

Selection Committee members have been selected to represent a group of building design and construction industry members capable of evaluating the quality of submissions and selecting final funding recipients using program criteria. Selection Committee members have also been selected to meet one or more of the following criteria:

- Knowledgeable of high-performance buildings and/or Passive House;
- Well-established and recognized as credible experts in the building design industry; and
- Capable of assessing the environmental, social, and aesthetic merits of applications.

7.2 Selection Committee Review Process

Prior to evaluation, Selection Committee members will be required to review and familiarize themselves with all competition documents, requirements, and other relevant details. A neutral Selection Committee Chair will ensure careful recording of the entire review process is observed, that all Selection Committee members adhere to process guidelines, and to maintain timeliness of the process. The Program Administrator will be present to take notes on Selection Committee comments that may be used for additional feedback to Participants or as promotional material, as well as provide additional assistance to the review process.

Selection Committee members will participate in a workshop consisting of a review of all Ranked Applications and the Technical Review Panel's findings report. Select members of the Technical Review Panel will be available to answer any questions and provide additional technical feedback to the Selection Committee. Selection Committee members will use the criteria outlined in Table 4, and will be provided with any materials necessary for review, including a scoresheet, list of criteria, and a copy of the Technical Review Panel's findings report. The Selection Committee will seek to identify a minimum of one Successful Applicant in each of the following categories, contingent on applications and available funding:

- Low-Rise MURB (Under 7 storeys)
- High-Rise MURB (7-storeys and above)
- Office building
- Retail building
- Institutional building

The Selection Committee may select additional Successful Applicants that meet exceptional standards based on availability of funds at the discretion of the Province. Selection Committee decisions will be submitted to the Province by the Chair, who will be responsible for the final decision. Decisions by the Province will not be subject to dispute or repeal and will be final and binding.

Table 4: Criteria for Final Selection

Criteria	Evaluation	Score
Energy and Emissions Performance	<ul style="list-style-type: none"> • Are energy modelling results realistic, based on the design? • Does the building’s design strategy pose any risks that may threaten the achievement of the Energy Step Code targets? • Is the project likely to meet either the highest step of the Energy Step Code or Passive House? • Is the project likely to achieve and maintain significant greenhouse gas emission reductions? • <i>Use value from TRP</i> 	/40
Cost-Competitiveness	<ul style="list-style-type: none"> • Does the project showcase the BC Energy Step Code using cost-competitive design strategies? • Is the premium associated with the project’s design reasonable and/or acceptable? • Do design strategies provide a durable building with low maintenance needs, long replacement cycles, and reduced reliance on mechanical systems? • <i>Use value from TRP</i> 	/20
Replicability	<ul style="list-style-type: none"> • Does the project make use of currently available building techniques and materials? • Does the design illustrate design strategies that can be used in other locations with similar climatic conditions? • Does the project make use of a design strategy that is likely to impact the market in a significant way? • <i>Use value from TRP</i> 	/10
Site and Aesthetic	<ul style="list-style-type: none"> • Is the overall form of the design aesthetically appealing? • How well does the project fit the site? • How does the design blend in with neighbouring buildings and the surrounding landscape? 	/20
Social and Environmental Health	<ul style="list-style-type: none"> • Does the project incorporate strategies to build resilience to climate change at the building or community scale? • Does the project seek to enhance environmental performance in areas beyond energy (e.g. potable water consumption, biodiversity, stormwater management, climate and seismic resilience, etc.)? • Does the project provide for or enhance social and individual health and well-being? • Is the project seeking any environmental or social performance standard (e.g. LEED, Zero Carbon Building, Living Building, Passive House, WELL, etc.)? 	/10
TOTAL SCORE		/100

7.3 Conflict of Interest

Selection Committee Chairs will be responsible for identifying any potential for conflict of interest by identifying any projects a Selection Committee has been involved with. In the event that a member of the Selection Committee is directly or indirectly involved with a project under evaluation, they will be required to recuse themselves and where necessary, a replacement member with a similar set of skills and expertise will be identified and added to the Selection Committee for the purposes of evaluating that project.

7.4 Net-Zero Energy-Ready (NZER) Incentives

Successful Applicants will receive the NZER Incentive, which has been designed to help offset the incremental capital cost associated with NZER building design. Incentive levels are intended to approximate the most cost-competitive incremental cost of constructing a building to the highest level of the BC Energy Step Code as compared to a base BC Building Code building.⁶

One NZER Incentive shall be issued to each Successful Applicant. NZER Incentives have been set as follows:

Building Type	NZER Incentive Amount
Low-Rise multi-family	• \$60/m ² to a maximum of \$100,000
High-Rise multi-family	• \$80/m ² to a maximum of \$350,000
Office	• \$10/m ² to a maximum of \$250,000
Retail	• \$40/m ² to a maximum of \$175,000
Institutional	• \$25/m ² to a maximum of \$350,000

To receive the NZER Incentive, Participants must:

- a. Be selected as a Successful Applicant by the Selection Committee and the Province;
- b. Submit the final permit prior to occupancy, as required by the authority having jurisdiction;
- c. Submit a final energy model and airtightness testing results to the Program Administrator;
- d. Agree to subject the building to the M&V process by the Program M&V Reviewer as described in Section 8 of this Program Manual;
- e. Demonstrate that energy meters have been installed and are actively reporting data.

Projects that meet the criteria above and that make significant use of wood products in their design and construction and that did not receive a NZER Incentive in the initial review by the Selection Committee will also be eligible for an incentive of the same value provided by Forestry Innovation Investment. To qualify for the wood-based projects incentive, the following criteria must be met:

1. Demonstrate project replicability to promote and educate on wood's potential in energy efficient construction.
2. The main structural building system is wood or wood-hybrid (such as wood-concrete or wood-steel); and wood is used in three or more structural or related applications (e.g. beams, columns, walls, floors, elevator shafts, staircases), *OR* wood is the primary material used in the total building envelope structure.

⁶ See the 2017 Metrics Report, https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/construction-industry/building-codes-and-standards/reports/bc_energy_step_code_metrics_research_report_full.pdf

8 Measurement and Verification

Successful Applicants will be required to have installed adequate energy metering and sub-metering to provide the tools to perform basic Measurement and Verification (“M&V”) on the project. This will allow the Program, building owners and managers to determine the actual energy performance of the project, and provide tools to understand where and how energy is used in buildings. The Measurement & Verification Team (“M&V Team”) will conduct all M&V processes after occupancy.

The M&V Team is sourced from a team of experts with demonstrated experience and success in designing, coordinating, and delivering M&V projects consistent with the International Performance Measurement and Verification Protocol (IPMVP) throughout the Province of British Columbia.

It should be noted that receipt of the NZER Incentive is not tied to the final energy performance of the building, but rather to the full completion of all Program steps, including the requirements in this section of the Program Manual.

8.1 Energy Metering Requirements

Successful Applicant’s buildings are required to have a permanently installed energy metering system to measure and record energy data, which is to include software which visualizes historical energy data for analysis. This Energy Metering Information System (EMIS) will be comprised of electrical, thermal energy and water meters and the required hardware to gather and archive metered data for a minimum 18-month period. The EMIS must be remotely accessible to the M&V Team.

Energy sub-meters are to be installed such that sufficient energy data is gathered to determine the projects actual Total EUI (TEUI) and Thermal Energy Demand Intensity (TEDI), as well as understand where and why deviations from TEUI and TEDI targets occur.

The energy sub-metering strategy used is to be appropriate for the size and complexity of the building and its energy systems. The EMIS must be designed to provide a sufficient level of sub-meters and data necessary to diagnose differences between predicted and actual energy performance and/or conduct a meaningful energy assessment or recommissioning activities. Further metering can be added if more detailed investigation and diagnosis of energy usage is desired. For projects pursuing LEED v4, achievement of the *Advanced Energy Metering* credit is acceptable to meet the intent of this requirement.

Where project buildings include residential components, and meters are not otherwise required by a utility, it is not required to sub-meter either the various energy forms or end-uses within individual residential dwellings. However, measurement of the aggregated energy use of the entire residential block(s) is required – i.e. total electricity, heating/cooling energy and domestic hot water (DHW) usage of the entire in-suite residential component is required.

The EMIS is most valuable when integrated to, or part of, the Building Automation System (BAS) as this enables use of systems operation data (trend logs) in the evaluation and optimization of systems performance. An integrated system also allows for the use of Analytics or Fault Detection & Diagnosis (FDD) software which can further improve operational efficiency.

8.2 M&V Process

All M&V processes will be conducted by the M&V Team and will include the following steps:

- a. A review of the M&V Plan (included with Program Application)
- b. Retrieval of energy metering data from the project’s EMIS
- c. Analysis and determination of the project’s actual TEUI & TEDI
- d. A high-level analysis and investigation of differences between actual and predicted energy performance
- e. A report of final results.

8.3 M&V Implementation

While all M&V processes will be conducted by the M&V Team, Participants are required to designate a team member or firm as the project M&V Consultant, who will be responsible for coordination of the metering strategy from start to finish. The M&V Consultant will be responsible for witnessing the installation of meters, ensuring they are actively reporting data, and demonstrating their installation to the M&V Team. This can be highly effective in coordinating between the various design consultants, stakeholders and construction team members to achieve successful implementation of the metering strategy.

8.4 Setting up a Portfolio Manager Account

Participants must have an ENERGY STAR® Portfolio Manager account containing the building project. Successful Applicants will also be required to share access to their Portfolio Manager in 'Read Only' mode with the Province and/or the Program Administrator. This will enable the Program to easily verify that the account has been properly set up.

Participants submitting a multi-unit residential building (MURB) project should note that automatic upload of benchmarking data for MURBs of over 20 units is now available from BC Hydro. Participants should visit the [BC Hydro Energy Efficiency Benchmarking webpage](#) for more details.

8.5 Conflict of Interest

In the event that a member of the M&V Team is directly or indirectly involved with the project under evaluation, they will be required to recuse themselves and where necessary, a replacement M&V Reviewer with a similar set of skills and expertise will be identified.

9 Terms and Conditions

9.1 General Conditions

- The BC NZER Program is only available to Part 3⁷ building projects located in British Columbia.
- Participants must ensure that building system designs adhere to the current BC Building Code and/or other applicable codes, standards and guidelines. Non-compliance with a regulation in force may result in the cancellation of any incentive.
- Participants who receive a Design Incentive are required to submit a full Program Application as a condition of the receipt of the Design Incentive.
- The Province reserves the right to change or terminate this Program at any time without notice, but will continue to process EOIs and Program Applications submitted prior to the announcement of the changes or termination under the procedures existing at the time of submission.
- The Province and/or the Program Administrator, as applicable, reserves the right to reject or accept, at its sole discretion, any applications submitted by an applicant. The submission of a completed EOI or Program Application form to the Program Administrator will not in any way guarantee the granting of any of the Incentives.
- The Province reserves the right to decide the baseline against which any measure will be compared. This may include, but is not limited to, current good design practice, current BC Building Code, or other applicable codes, standards and guidelines (i.e. City of Vancouver Energy utilization By-Law).
- Decisions relating to eligibility, the amount of any Incentive, or other issues, will be final and binding on all parties.
- The Program Administrator, Technical Review Panel, Selection Committee, and Province, as applicable, will conduct an evaluation of Applicant's submissions within a reasonable time after submission.
- Program Applications will not be evaluated until and unless all required information is received by the Program Administrator.
- The Province and the Program Administrator, as applicable, reserve the right to determine whether or not any Program Application is complete and all required information has been submitted
- The Province reserves the right to determine the level of any Incentives that will be offered to the applicant.
- The Province and the Program Administrator will have no obligation, risk, title or interest in connection with any energy conservation measures adopted or recommended by the Participant.
- The Province and the Program Administrator, not being designers or manufacturers of energy efficient products or designers of buildings, make no representation or warranty whatsoever, express or implied, as to the fitness, quality of design practices or capability of the material, equipment or workmanship, nor warrants that any design or product will satisfy the requirements of any law, rule, specification or contract.
- Participants and Successful Applicants will be responsible for all taxes and fees associated with the receipt and/or use of any Incentives.

⁷ Part 3 Buildings are buildings classified as Group A, B or F-1, or exceeding 600 m² in building area or exceeding three storeys in building height and have major occupancies. Group C (residential), Group D (office/service), Group E (retail), or Group F-2, F-3 (medium- and high-hazard industrial).

9.2 Disclosure of Building Information

- As part of their Program Application, Participants are required to submit: drawings and images on mechanical and envelope strategies, energy conservation measures, energy and carbon performance, costs, and/or other details pertaining to project design. The Province reserves the right to publish all materials submitted by Participants as a part of the Program Application, but will review materials with Successful Applicants prior to publication to ensure privacy concerns are addressed and sensitive information is not disclosed to the public.
- Participants are required to submit their project to a process of Measurement and Verification, and as such must be prepared to include necessary metering infrastructure into project design.
- Successful Applicants may be required to share information on building design and performance in a workshop format in order to share lessons learned to other members of the BC building design and construction industry.
- Successful Applicants must have an ENERGY STAR Portfolio Manager account containing the building project. Successful Applicants will also be required to share access to their Portfolio Manager in 'Read Only' mode with the Province of British Columbia.