

CleanBC Commercial New Construction Program

Consultant orientation manual

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Program introduction

The purpose of CleanBC Commercial New Construction Incentives (“the program”) is to provide an offering that will assist customers in the design and construction of new high performance, more electrified Part 3 buildings in the Province of British Columbia and encourage customers to switch from high carbon fuels to clean electricity in order to reduce greenhouse gas (GHG) emissions.

A key objective will be to continue to encourage the design and development industry to adopt an integrated design process and building performance modelling as standard practices, and as a result, promote higher performing, energy efficient and more electrified buildings.

Electrification Measures (EMs) will be focused on the building heating system/plant only (space heating, ventilation, service hot water heating and process heating systems). Customers should continue to pursue non-electrification measures (building envelope, lighting, equipment loads, fans, pumps etc.) to high efficiency levels. It will be advantageous to customers to design energy efficient buildings by reducing building loads and integrating mechanical systems in a way that maximizes utilization of heat pumps (low temperature hydronic systems, extensive use of heat recovery, heat storages etc.) to an extent that no gas would be required as a backup heating source. This will ideally result in a highly efficient electrified building with lower energy bills in comparison with an average (non-optimized) new building.

With a focus on customers with a Key Account Manager, BC Hydro will work with developers and their design teams in the design process, and provide them with a range of tools and potential financial incentives.

On behalf of CleanBC, BC Hydro will deliver the program and leverage similar processes to its previous Commercial New Construction program. This will involve Project Initiation and Assessment, followed by an Energy Study Proposal Review, Energy Study Submission and Review, and Project Implementation Capital Incentive Funding, subject to approvals.

Purpose of this guideline

This manual has been prepared to serve as a guide for consultants participating in the program to help:

1. Orient consultants on the overall program concept, objectives, and approach
2. Inform consultants how to apply for pre-qualification
3. Identify the program process and required deliverables

BC Hydro contacts

To obtain further information about the program contact your BC Hydro Key Account Manager. If a customer does not have a Key Account Manager they should contact BC Hydro’s Business Help Desk at incentives@bchydro.com, 604 522 4713 in the Lower Mainland, or 1 866 522 4713 elsewhere in B.C.

Offer

An important part of designing energy-efficient buildings is choosing the most suitable components and systems. Using an integrated design process and energy modelling software in the earliest design phase, the project's design teams should look at different alternatives and create a business case for the best options, accounting for life cycle cost (ongoing energy and maintenance cost), energy savings, and payback period. The offer would help further electrification optimization of the schematic building heating system/plant design by potentially providing energy modelling study funding and capital incentives for implemented electrification measures (EMs).

1 Eligibility

1.1 Project eligibility

To be eligible for the offer, the project must:

- Be new construction or a major building renovation¹
- Be at the end of the schematic design stage
- Have proposed hybrid heating plant (heat pump with natural gas boiler boost/backup) or 100% fossil fuel heated buildings (100% electrically heated buildings should not apply)
- Offer potential annual electrical energy consumption increase
- Offer a minimum estimated greenhouse gas emissions reduction of 400 tCO₂e lifetime compared to the initial schematic design or code compliant mode
- Be located in the BC Hydro service territory, including New Westminster

1.2 Consultant qualification requirements

LEAD CONSULTANT

The lead consultant's role is to coordinate the project's deliverables such as the Energy Study Proposal and Energy Study Report. As Project manager, the lead consultant is in charge of building design on behalf of the client. All lead consultants must be pre-qualified, and can be an energy modeller, mechanical consultant, or architect.

In order to qualify, a lead consultant must be:

- a member of the BC Hydro Alliance of Energy Professionals ("the Alliance"). This requires \$2M in liability insurance, references for proven track record, and a safety background check from WorkSafeBC. Contact alliance@bchydro.com to join.
- a Lead consultant, CEM, CVMP, CEA and must be a registered P.Eng

APPROVED MODELLER

A modelling (or mechanical engineering) consultant company must demonstrate that the modeller designated to perform energy modelling work has the appropriate training and experience. The modeller does not need to be an Alliance member to qualify.

See the Provincial New Construction Energy Modelling Guidelines for full details.

¹Major building renovations defined as one of the following, all of which require a building permit and certified building 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
- Renovations that are worth at least 50% of the existing building's value and impact the building envelope.

2 Incentives

2.1 Energy study incentive

If eligible after the pre-screen review, the energy study incentive will co-fund the cost of completing the required energy study. BC Hydro will pre-approve the cost of the study based on the project scope provided in the Energy study proposal.

The study incentive will be paid upon approval of the Energy study/Workbook submission and review of invoices. You have 9 months from the date of the signed Energy Study Agreement to complete the energy study. The applicant (building owner, developer, general contractor or customer) must provide copies of invoices with proof of payment for modelling costs within 9 months of study report approval.

The program will fund up to a \$15,000 towards the energy study.

2.2 Capital incentive

If eligible, a capital incentive will be offered for projects to reduce the incremental cost of the EM(s), reduce payback periods and help customers transition from more carbon-intensive fuels to clean electricity.

Projects must demonstrate a minimum threshold of 400 tCO₂ total combined reduction over the estimated life of the measures when compared to the original schematic design or code compliant model.

Incentives will be tiered based on the projects, building type and code requirement.

TIERED INCENTIVE BASELINE TABLE

Building type	BC Energy Code Requirement	Incentive rate in \$/tCO ₂ e over measures lifetime	Baseline heating source*
MURBs up to 6 stories	BCBC	30	100% Gas
	Step 2 TEDI	35	100% Gas
	Step 3 TEDI	60	100% Gas
	Step 3+ TEDI with GHGi < 8 kgCO ₂ /m ²	100	As proposed in schematic design
	Step 4 TEDI with GHGi < 4 kgCO ₂ /m ² **	120	As proposed in schematic design
MURBs over 6 stories	BCBC	30	100% Gas
	Step 2 TEDI	35	100% Gas
	Step 2 TEDI with GHGi < 8 kgCO ₂ /m ²	60	As proposed in schematic design
	Step 3 TEDI	60	100% Gas
	Step 3 TEDI with GHGi < 8 kgCO ₂ /m ²	100	As proposed in schematic design
	Step 4 TEDI with GHGi < 4 kgCO ₂ /m ² **	120	As proposed in schematic design

Building type	BC Energy Code Requirement	Incentive rate in \$/tCO ₂ e over measures lifetime	Baseline heating source*
Office	BCBC	30	100% Gas
	Step 2 TEDI	60	100% Gas
	Step 2 TEDI with GHGi < 8 kgCO ₂ /m ²	100	As proposed in schematic design
	Step 3 TEDI	100	100% Gas
	Step 3 TEDI with GHGi < 4 kgCO ₂ /m ² **	120	As proposed in schematic design
Retail	BCBC	30	100% Gas
	Step 2	60	As proposed in schematic design
	Step 2 TEDI with GHGi < 8 kgCO ₂ /m ²	100	As proposed in schematic design
	Step 3 TEDI	100	100% Gas
	Step 3 TEDI with GHGi < 4 kgCO ₂ /m ² **	120	As proposed in schematic design
Hotel/Accommodation	BCBC	30	100% Gas
	CoV Rezoning	100	As proposed in schematic design
Warehouses	BCBC	30	100% Gas
Institutional (healthcare and university)	BCBC	30	100% Gas
Institutional (schools)	BCBC	60	100% Gas
Other public (pool-rec center)	BCBC	30	100% Gas

* Applies to all building heating systems (space, ventilation and domestic hot water heating)

** Rezoning projects in the City of Vancouver choosing Passive House Standard certification path default to this baseline

Additional rules:

If a project is receiving additional capital-related funding from another Ministry of Energy, Mines & Low Carbon Innovation energy efficiency or low-carbon capital incentive program, that amount will be deducted from the total capital incentive the applicant is eligible to receive through the Clean BC Commercial New Construction program.

3RD PARTY THERMAL ENERGY PROVIDER (TEP):

- Where it is demonstrated that the Developer is incurring the upfront incremental capital cost to construct a more efficient TEP system, then CleanBC would look to fund incentives for plant GHG saving benefits below the baseline.
- Demonstrated proof would be in the form of progress draws including summary of costs that the developer has paid for the plant.
- If the TEP designs, builds and owns the system and incurs the upfront incremental capital cost of the project then CleanBC will not fund any portion nor claim any plants GHG savings.

INCENTIVES WILL BE CAPPED AT THE LESSER OF:

- a maximum incentive for any project of \$500,000 or
- a two year customer simple payback threshold is reached

Completing an Energy Study is not a guarantee of capital incentives. All capital incentives are subject to program funding, and are solely at the program's discretion.

INCENTIVE PAYMENT TIMING:

- 100% of the incentive amount will be paid upon the Customer's signed and returned Capital Incentive agreement **subject to receiving sufficient proof in the form of either a Progress Draw, Paid Invoice, or fully executed Purchase Order(s) or Proof of Purchase of approved building system(s) in an amount equal to or greater than 100% of the Incentive amount.**
- If the project is further electrified from the baseline and is built to 100% electric space, ventilation and domestic hot water heating (with no gas boiler as a backup) the project is eligible to receive a 10% bonus of the Capital Incentive. Subject to the final Site Inspected findings and adjustments. The minimum bonus is \$10,000 and maximum is \$50,000.

3 Energy Study

The purpose of the energy study is to promote integrated design practices early in the design process and identify feasible, electrification measures. Once reviewed and approved by BC Hydro, the study is also used to calculate the level of capital incentives that BC Hydro may offer.

The study should be comprehensive and happen once the schematic design is completed but prior to final design. All submissions must use the latest version of the CleanBC Commercial New Construction Incentives Energy study proposal and Report Workbook.

The study must be performed using 8,760-hour whole building computer simulation software. The list of approved energy simulation software and additional energy modelling requirements can be found in the Energy Modelling Guideline.

3.1 Project baseline

The program's baseline is the proposed building schematic design model (subject to BC Hydro Approval). This model represents a reference design which could be improved by additional heating systems optimization (not strictly related to a fuel switch measures) modeling from the heating plant originally proposed during the schematic design stage (before the electrification optimization). **The baseline model should comply with applicable energy code(s), legislations or by-laws and should not take into account the organizations or project specific aspirational goals, specifications, or any other voluntary efficiency/sustainability targets, unless these are mandatory and are fully funded independent of this program. Projects with voluntary efficiency/sustainability targets would require modeling changes of heating system/plant, mainly to comply with heating source ratio provided in the program's tiered incentive table.** To qualify for this program, the improved energy efficient design model should result in an increase of heating system electrical energy consumption and significant reduction of fossil fuel consumption as a result of higher heat pump utilization and other electrification measures related to the heating system.

The program requires that code compliance and building loads reduction modelling have been already performed during the schematic design and prior to the program application.

For projects subject to the BC Building Step Code, a modeling consultant will be required to submit (in PDF or other electronic format) either the Schematic Design Modeling Report or BC Building Energy Step Code Modelling Report which demonstrates/verifies the claimed heating source ratio in the Pre-Screen tab of the program Workbook. Projects whose baseline model defaults to 100% natural gas heating source (as per program's tiered incentive table) are exempted from this requirement. The schematic design model should be compliant with the following Codes, legislations or by-laws (whichever applicable):

- ASHRAE 90.1 2016
- NECB 2015
- BC Energy Step Code—if enacted by municipal government policy (or chosen as a compliance path option in BC Building Code)
- City of Vancouver Rezoning Policy where applicable.

See the Energy Modelling Guidelines for full details.

4 Program process

Step 1: Project eligibility assessment (pre-screen submission)

After completion of the schematic design model (or Code Compliance model), the project's lead consultant (usually energy modeler) has to fill out and submit the pre-screen section of the CleanBC New Construction Incentives Workbook. After BC Hydro review and acceptance of the project, it is essential for the success of the proposed study to have a meeting with the client, design team, and BC Hydro program representatives to ensure a good understanding of project's schematic design details along with the program's requirements, process and deliverables. This step is highly recommended before submitting the Energy Modelling Study Proposal section of the workbook.

New Construction measures can include the following:

- Heat recovery chiller
- Air-to-water heat pump
- Air-to-water heat pump water heater
- Ground source heat pump
- Air-to-air rooftop heat pump
- Water-to-water heat pump
- Exhaust air heat recovery heat pump
- Sewage heat recovery heat pump
- Electric boiler*
- Electric water heater*
- High-efficiency (>75%) HRV**
- Air source VRF
- Water source VRF
- Distributed water to air heat pumps.

*Electric boiler and electric water heater will be only accepted if all other more efficient heat pump options are not feasible, or as a backup heating source. Electric baseboard heaters will not be accepted as a measure if they are proposed to be the main space heating system.

**HRV is an eligible electrification measure if combined with electrified (heat pump based) space heating system and if it is not required by Code, or municipal bylaws.

Step 2: Energy study proposal

If the project meets program requirements, the applicant must complete and submit the Energy Study Proposal section of the workbook to their BC Hydro Key Account Manager.

The purpose of the workbook is to communicate the general project and modelling details, including the design team to be involved in the study, building baseline, scope of work, and the study cost breakdown for funding approval. Please refer to Energy Modelling Guideline for more detailed study proposal submission requirements.

Once the proposal is approved, BC Hydro will create an Energy Study Agreement.

Step 3: Energy study

After the proposal has been approved and an Energy Study Agreement with the applicant has been signed, work may begin on the Energy Modelling Study. The program requires only one study, submitted to us during the project design development stage. The Energy Study Report must be submitted in the Study Report Workbook format (Excel). Please refer to the Energy Modelling Guideline document for more detailed study report submission requirements.

Step 4: Review and approval by BC Hydro

The completed study will be reviewed by BC Hydro. If required, additional information may be requested. In certain cases BC Hydro may request actual modelling files for a more detailed modelling review.

The project must provide a minimum of 400 tCO₂ total combined reduction over the estimated life of the measures, as well as efficient electrical energy consumption increase in order to be eligible for capital incentives. Upon approval of Energy Study Report, BC Hydro will create an agreement outlining the incentive amount and any other requirements that need to be met. Once a Capital Incentive Agreement has been signed, the applicant can then order and purchase EMs eligible for incentives. Any purchases or orders placed prior to signing an agreement are not eligible for funding.

Step 5: Post-tender energy study update (if applicable)

A post-tender modelling update will be required in case that building design and/or building size has been significantly changed after the approval of pre-tender energy study, and in cases where some of the approved EMs have been excluded by the applicant after the tender.

If the total energy study funding support has already reached the maximum amount as described in section 2.1, no further study funding will be provided. If not, the additional modelling fee can be submitted to BC Hydro with proper justification and an estimate of additional modelling hours required for study update. However, the initial funding support plus the post tender update must not exceed the specified maximum amounts.

The results of the updated energy study will be used to adjust any capital incentives that were offered. After review and approval of the final energy study, BC Hydro will complete a Capital Incentive Agreement Addendum with the applicant, incorporating the adjusted incentive amount based on the final energy study results.

Step 6: Project site inspection

The following project completion documents must be submitted within 36 months of signing the Capital Incentive Agreement:

- Completed BC Hydro Schedule B Installation Completion Document, which includes expected and actual costs for implemented EMs.
- Completed BC Hydro Schedule C Invoice Reconciliation, which includes paid invoices, an invoice summary report, or a progress payment summary for the installed EMs.
- Building permit indicating date of issue.
- Occupancy Permit, Conditional Occupancy Permit or reasonable proof of substantial occupancy.

Once the project completion documents have been reviewed and accepted by BC Hydro, BC Hydro will perform a site inspection. The following documents must be provided at the time of the inspection:

- Mechanical as-built drawings.
- Shop drawings associated with the installed EMs.
- Operations and maintenance manuals.

If the inspected GHG reduction is less than the proposed reduction in the study, the incentive funding will be adjusted accordingly.

Energy study Q&A

Who should I contact if I have technical questions?

If you have any technical questions, or are unsure how a measure or system should be simulated, contact the Program Engineer appointed to the project. It's important that simulation issues be resolved early to avoid additional work later on. Don't hesitate to call or e-mail with any questions or clarifications.

Do we need to provide total capital costs, or just the incremental cost of the measure?

The program will use the incremental costs for the assessment. When submitting completion documents at the end of the project, BC Hydro requires total capital costs for both the baseline and the EM, where these have been explicitly identified in the tender documents.

What level of costing detail is required?

The costing for the identified EMs should be broken out in sufficient detail that we can review and assess its accuracy. At minimum, major equipment should be broken out, as well as labour and materials. Incremental cost estimates must be provided by either:

- a registered Quantity Surveyor, or
- a qualified contractor selected by applicant

General Q&A

What rate should we use for electricity?

All energy cost savings must be based on current rates for gas and electricity. This must include energy charges, demand charges, taxes, and any other applicable components of the rate structure. See details at our Business Rates Overview. bchydro.com/accounts-billing/rates-energy-use/electricity-rates/business-rates.html

What simulation program can be used for whole building analysis?

Any programs that use 8,760 hour simulations and have been tested according to ASHRAE Standard 140 can be used. The list of the approved modelling software is provided in Energy Modelling Guideline.

What impacts does the BC Energy Step Code have on the program?

The program leverages BC Energy Step Code modelling files for the available building types, with respect to the building baselines envelope heat loss values and HRV requirements. Refer to the Energy Modelling Guidelines for details.

