

Q&A from March 23, 2021 Builder Forum Series on Fenestration and Step Code
Presented by the Township of Langley (TOL), Adrian Kanjer of BC Hydro, and Cascadia
Windows & Doors

Q: What are the rebates for renovations?

TOL: The Township of Langley offers a rebate through our Green Building Rebate Program for those that decrease their home's energy use by at least 10 GJ/year after a home retrofit. To be eligible, the applicant must obtain a Building Permit for their retrofit and complete a pre-retrofit home energy evaluation and a post-retrofit evaluation. The rebate is \$15 per 1 GJ/year up to a maximum value of \$750. An Energy Evaluation rebate of \$300 is also available. The application process is completed with Township of Langley staff. Visit tol.ca/greenbuildings or email greenbuildings@tol.ca for more information. Subject to availability.

Additional rebates are available externally through the province's CleanBC Better Homes and for upgrades to insulation, windows/doors, home heating systems and more. Visit betterhomesbc.ca for more information and to apply. Subject to availability.

Q: Has BC Hydro upgraded their systems to handle the increased electrical loads with EV chargers and all electric homes when considering the aging grid system?

Adrian Kanjer, BC Hydro: BC Hydro is committed to providing reliable electric services to all regions and customers and has considered the increase in demand and grid upgrade requirements.

Q: How many applications have been participated this program provincial wide and how many applications are in lower mainland/Fraser Valley?

Adrian Kanjer, BC Hydro: In total we have over 130 dwelling units applied for at over \$1 million committed so far since December 2020. There is a good balance of representation across BC.

Q: If you put in a gas line for only a bbq in the back yard does this disallow the rebate?

Adrian Kanjer, BC Hydro: It will not disallow the Heat Pump Pathway rebates, the Energy Step Code Pathway rebates, or the Energy Advisor Support rebate. It will disallow the All-Electric rebate.

Q: How much on average does an energy advisor cost per single family new home? How much is an energy advisor on average?

TOL: The cost of an energy evaluation can vary widely depending on the specifics of the home, especially its area. Generally, their services vary from \$500-\$1000 for a single family home evaluation. Visit betterhomesbc.ca/ea to find an Energy Advisor in your area.

Rebates for Energy Advisors are available through the Township of Langley's Green Building Rebate Program and CleanBC's Better Homes BC. Visit tol.ca/Greenbuildings and betterhomesbc.ca for more information.

Q: Is TOL allowing the new HOT2000 v11.10 weather files to be used in energy models rather than BCBC Appendix C values for HDDs and design temperatures?

TOL: No. To be consistent throughout the Township, we will continue to request Energy Advisors to use Abbotsford weather files along with HDD and design temperatures as per BCBC Appendix C for Langley.

Q: EA's sometimes specify windows with high Solar Heat Gain Coefficients when using HOT2000 to analyze the building, which credits solar heat gain with reducing building heating costs in the winter season. But this can lead to overheating or high cooling costs in the summer - which is why the ER path is not allowed when complying under 9.36 of the code. Is anything going to be done about this?

Cascadia: Cascadia has not been in touch with NRCan about changes to Hot2000 calculations, as it's not a software we have supplied data or input. Like most NRCan programs, assuming there's a feedback mechanism online to provide them suggestions. Anecdotally, it seems like the vast majority of homes would benefit all year-round from a slightly better window, rather than a slightly worse window that gets a "pass" from allowing in more heat from the sun.

Q: Are these emissions stats just for our region or global?

TOL: The emission stats on slides 38-39 are just for the Township of Langley. To learn more about Climate Action in the Township of Langley, please visit tol.ca/climateaction

Q: Where can I find the green building rebate program referral form? I couldn't find the TOL website.

TOL: The Green Building Rebate Program referral form is usually given to builders when they apply for a Building Permit. If you did not receive one or need a new one, please contact greenbuildings@tol.ca. Note: this form is specific to each Building Permit, so we do not keep a generic copy on our website.

Q: What SHGC per orientation, would you suggest for Vancouver?

Cascadia: It's difficult to offer a generalized suggested because there are so many variables that come into play, including the lot conditions, building design and mechanical systems. Best suggest would be to work with an energy advisor or consultant to address project-specific requirements.

In our view, orientation – while a significant consideration for windows, views, shading and solar control – is normally beyond one's control, given that most lots don't offer the flexibility to orient a building however one might like. Therefore, we find that orientation is best used to *inform* the weight that a designer places on other considerations. For example, if you have a south-west exposure to the room that you want the most glazing in to maximize a great view, the designer better add more weight (attention) to including shading a low SHGC glazing choices, compared to if that great view was to the northeast.

Q: Could you not just return your exterior insulation into your opening and keep your window in its regular position?

Cascadia: It sounds as though you're describing over-insulating the window frame. Over-insulating is a good solution for improving the thermal performance of the envelope, though it does require specific detailing and quality controls in the field to maximum its efficacy. Specifically, attaching cladding or flashing returns requires thinking through your details at window frames, since most window manufacturers don't want you screwing building components onto their window frames.

Q: What's your view on the cost vs performance advantage of using other than air filled glass? i.e. argon, krypton

Cascadia: Argon is a common and highly effective insulative gas used in many insulated glass units (IGU). Argon-filled windows performs better than air-filled windows. Krypton in another inert gas—similar to Argon—sometimes used in less common IGUs. It provides slightly better thermal performance compared to Argon, but does carry a premium cost.

Q: How would you compare the thermal bridging performance of an aluminium vs vinyl frame window?

Cascadia: Performance of both aluminum and vinyl is often impacted by specific product components used in that windows, such as thermal breaks and steel reinforcement. Typically, unreinforced vinyl has significantly higher thermal performance than traditional, thermally broken aluminum.

Q: What is the SHGC limits for double, triple glazed windows?

Cascadia: SHGC for windows is controlled by the LowE coating product(s) that are included in the glazing units. Most window manufacturers offer a range of LowE choices that include high-SHGC, low-SHGC and a couple in between. For triple glazing, this same range usually exists. It's interesting to note that with triple glazing, while the extra pane of glass gives us the opportunity to have a second LowE coating (for increased thermal performance), it is the outermost LowE coating that regulate SHGC in a triple glazed unit.

Q: Cost of triple fiberglass over double glazed window in percentage?

Cascadia: For Cascadia, triple glazed windows carry an average cost premium of 12% compared to double glazed, and offer a roughly 80% increase in thermal performance.

Q: How much does triple glazing add to a SFD window package over double glazing?

Cascadia: See answer above.

Q: Will the gas fill not leak out over 20+ years?

Cascadia: When supplied by a quality IGU manufacturer that is a member of IGCC, the IGUs Argon fill should commonly last 20+ years and for the majority of units, a good deal longer than that.

Q: Could you be able to share that menu?

Cascadia: This related to the "range" of SHGC options provided by LowE coating products. See question above re "SHGC limits and double vs triple glazing".

Q: What's your view on the use of spandrel in the overall thermal performance of a building? e.g. pros and cons

Cascadia: Spandrel glass and metal can both be used as an opaque fenestration material in the slab bypass of Cascadia's Window Wall. Generally, these areas perform better than clear glass, but not as well as a properly-insulated framed wall. From a scientific perspective, it makes sense to use spandrel units strategically throughout a fenestration system where you do want to bother building small sections of exterior wall, but not to count on them for vast areas of a building that could be better served by cladding.

Q: What is the payback on the upgrade based on energy savings in the lower mainland going from double to triple? Based on going with lots of windows on a single family home and still meet the step code

Cascadia: It's difficult to offer a generalized answer because there are so many variables that come into play, including the lot climatic conditions, building design, mechanical systems and end-user behavior. Best suggestion would be to work with an energy advisor or consultant to address project-specific requirements. In the vast majority of project results we've seen, triple glazing pencils out quite well. It's the single cheapest *and easiest* upgrade that you can make that improves the whole building enclosure's thermal performance. It's important to note that the advantage of triple glazing (and therefore cost effectiveness) will depend on the *frame's* performance of the window product that it is in.

Q: What is the payback on the upgrade based on energy savings in the lower mainland going from double to triple? Based on going with lots of windows on a single family home and still meet the step code

Cascadia: "Lots of windows" is not a decision that increases a building's thermal efficiency; it harms it. However, it can be a lovely choice for the humans in the building that wish to enjoy a great view and the benefits of more natural light. In this case, triple glazing can be a key measure for repairing the "damage" that a lot of windows can do to your energy model – getting you back into compliance where you might not have been without it.

Q: Any incentive programs available for updating windows for a retrofit single family home?

TOL: CleanBC Better Homes offers rebates of up to \$2,000 for new windows and doors. Please visit <https://betterhomesbc.ca/rebates/window-and-door-replacement-rebates/> for more information. These rebates are a limited time offer.