



Advanced Briefing of Options for Advancing Energy Efficiency for New Buildings

Prepared for:
The District of Squamish

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Introduction

- **District of Squamish's Community Energy Action Plan:** A series of *catalyst projects* having a goal of reducing energy consumption and GHG emissions over 5-10 years
- One of the catalyst projects: **development of an Energy Efficiency Strategy for New Buildings** (residential, commercial, institutional and industrial)
- **Strategy Development Process:**
 - **Stage 1** - Overview of options, recommendations
 - **Stage 2** - Development of chosen policy/policies (including Checklist for new development)
- **Today's workshop objective:** to provide the District of Squamish and its stakeholders with the context, options, and guidance necessary to provide the consulting team with the direction it needs to develop the Energy Efficiency Strategy.



Background

- Squamish is one of 34 local governments participating in the Community Action on Energy and Emissions (CAEE)
- The DoS's Energy Efficiency for New Buildings Strategy is intended to help the District of Squamish achieve the following provincially endorsed CAEE targets:
 - Achieve an EnerGuide for New Houses rating of 80 for 100% of new detached single-family and row houses by 2010;
 - Achieve energy performance 25% better than the Model National Energy Code for 100% of new multi-unit residential buildings by 2010;
 - Achieve energy performance 25% better than the Model national Energy Code for 100% of new commercial, institutional, and industrial buildings by 2010.
- Squamish also has complementary targets for municipal buildings



Context: Legislative Authority

- The Local Government Act, Community Charter and Land Title Act are main authorities
- The BC Building Code governs building standards - applies like a bylaw
- **(1) Direct authority over standards:** some apparent direct authority to set own municipal standards but in reality very constrained (non-Code, health, prot. ppty or persons)
- To set energy efficiency standards - would need Ministerial approval/agreement to create separate regulation (prolonged process, out of District's control, context is provincial reluctance to create patchwork quilt)
- Note: City of Vancouver unique powers re: energy efficiency
- **(2) Land use planning authority:** the most ready power for local governments to take action now



Context: Legislative Authority (cont'd)

Land use planning authority that can influence building choices:

- Setting OCP or Regional Growth Strategy policy
- Development Permit Area Guidelines
- Requiring Building Energy Performance Standards via Rezoning
- Incentives
- Revitalization Tax Exemption Bylaw (for Energy Efficiency features)
- Density Bonusing
- Phased Development Agreements
- Heat Loss Calculation for Building / Heating Permit
- Development Permit / Rezoning Energy Efficiency Checklist

Complementing these powers are:

- Covenants
- Imposition of contractual terms (e.g. on municipal land sale RFPs)
- Bonding or security provisions in associated bylaws

- Other provincial legislation that is relevant to energy efficiency in building construction is the Energy Efficiency Act.



Context: Proposed Additions to the Code

- Proposed new section for 2006 BC Building Code
- Section 10 would include energy and water efficiency requirements for Part 3 and Part 9 buildings. 'Part 9' generally refers to SFD and other residential buildings that are 4 stories or less though there are non-residential buildings that are classified at Part 9. 'Part 3' generally refers to high-rise multi-family residential buildings and larger industrial, commercial and institutional buildings.
- The energy-related proposed changes for the Squamish region are:

Part 9

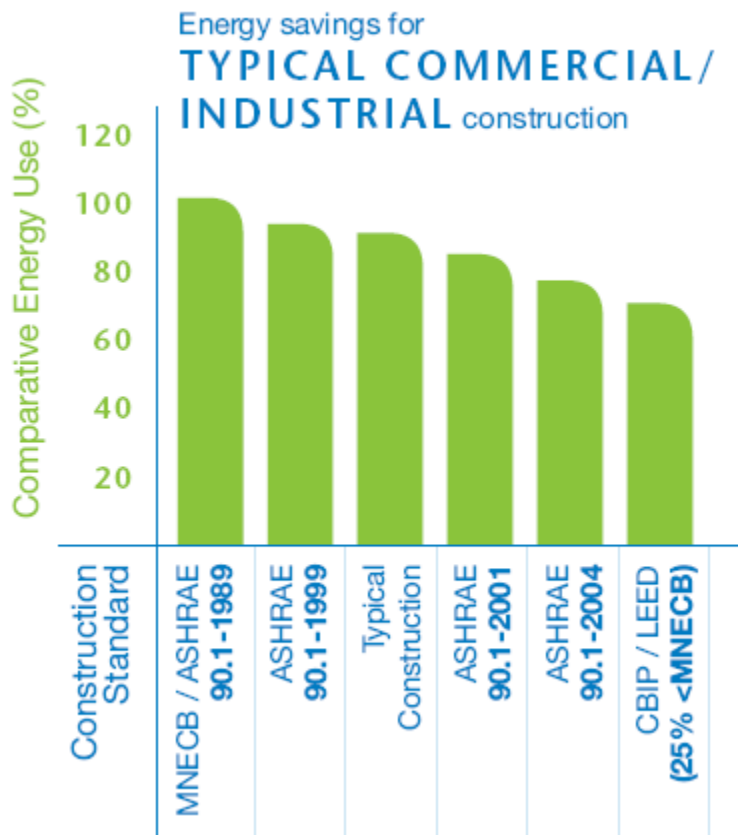
- RSI 3.5 (R-20) of frame wall insulation, achieved through 2x6 construction with insulation in the walls, or by adding 1 inch of extruded polystyrene insulation sheathing to the outside of a 2x4 assembly that has R-14 in the framing
- RSI 2.1 (R12) of full height basement insulation (rather than to 0.6 meters below grade)
- Alternatively, meet EGNH 77

Part 3

- Meet requirements of the ASHRAE 90.1 - 2004 energy standard. ASHRAE 90.1 2004 includes standards for building envelope; heating, ventilating and air conditioning (HVAC) systems; service water heating; and power, lighting, and other equipment. ASHRAE standards vary for different climate zones.
- Note that even with the new energy efficiency requirements to the BC Building Code, the District of Squamish will not meet its target for new buildings.



Target Shortfall - Part 3

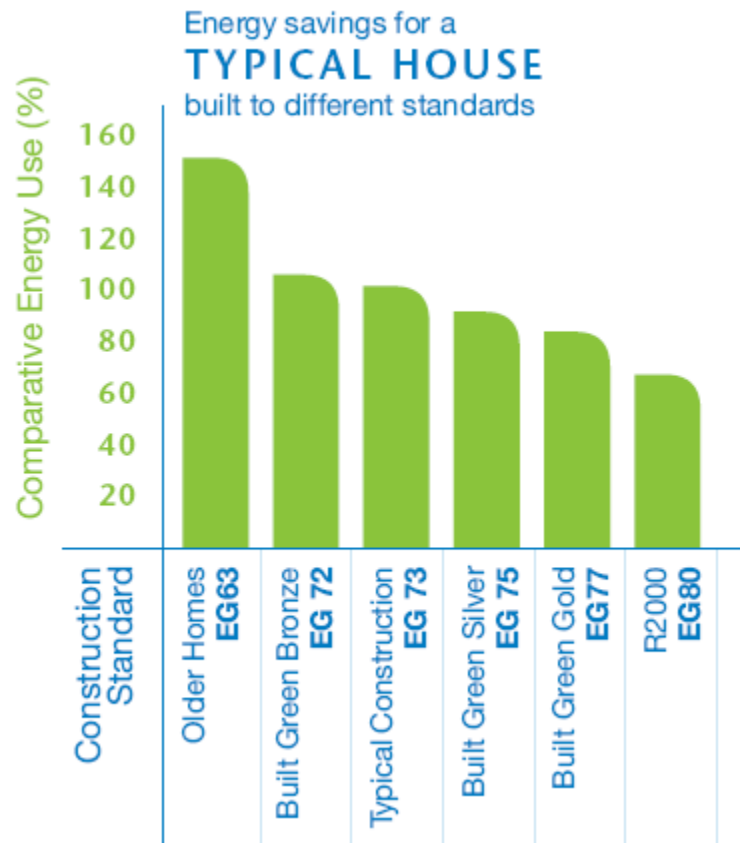


- The DoS target: energy performance 25% better than the Model National Energy Code for all new multi-unit residential and commercial (Part 3) buildings by 2010.
- The table shows the relative energy savings of varying levels of energy standards.
- 25% better than MNECB is about 5% better than ASHRAE 90.1-2004 (the new code). Thus, the new code will still leave Squamish short of its target.
- Enabling policies and incentives will be required to meet Squamish’s target.

Source of illustration: Fraser Basin Council. 2007. *Energy Efficiency & Buildings: A Resource for BC’s Local Governments.*



Target Shortfall - Part 9



- DoS target: EnerGuide for New Houses rating of 80 for all new detached single-family and row houses by 2010.
- The table shows the relative energy savings of varying levels of energy standards. In this graph, EG 77 (new code) is about 10% less efficient than EG80.
- A recent analysis commissioned by MoEMPR show that energy savings from EG 77 compared with EG 80 for the lower mainland range from 8%-15% (depending on whether it is gas or electric heating).
- Enabling policies and incentives will be required to meet Squamish's target.

Source of illustration: Fraser Basin Council. 2007.
Energy Efficiency & Buildings: A Resource for BC's Local Governments.



Policy Context - Policy Direction in the OCP

- Energy efficiency objectives in the OCP: important guidance for policy and decisions
- OCP gives broad policy direction to 3 groups of actors: council, staff and developers/community
- The District of Squamish draft (2007) OCP includes a stand-alone section on energy and air emissions (Section 17). Conservation and efficiency objectives cover:
 - Buildings, vehicles and infrastructure
 - Reduction in fossil fuels, increased fostering and use of renewables
 - Minimize GHG emissions
 - Goals for municipal leadership and private sector performance
- This high level policy foundation positions the District well for developing policy measures that will result in tangible energy-related benefits.



Policy Options

- Policies to advance energy efficiency for Part 9 and Part 3 buildings.
- A range of regulatory and policy instruments - the most viable are:
 - Development Permit Area Guidelines
 - Requiring Building Energy Performance Standards via Rezoning
 - Incentive for Building Permit Fees
 - Revitalization Tax Exemption Bylaw (for Energy Efficiency features)
 - Density Bonusing
 - Phased Development Agreements
 - Heat Loss Calculation for Building / Heating Permit
 - Development Permit / Rezoning Energy Efficiency Checklist
- We'll describe each, provide examples, highlight pros and cons and discuss applicability.

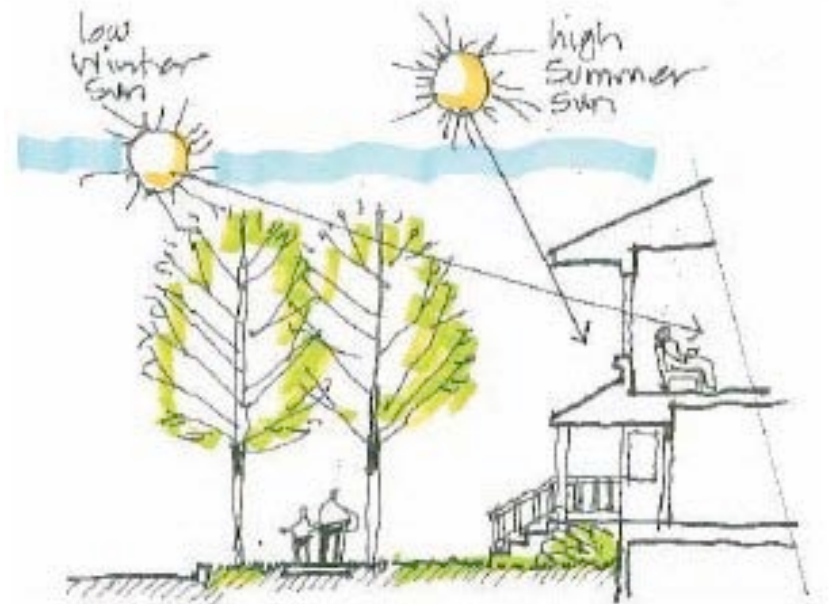


Policy Options - Development Permit Area Guidelines

- DPAs are authorized by Local Government Act
- Form and character guidelines
- For energy goal - design guidelines that result in passive solar gains and natural ventilation
- This tool can apply to intensive residential, MURBs, commercial, and industrial buildings.

Example - District of Saanich

- “Community Design Principles and Guidelines” (2007) - Holland Barrs Planning Group
- Currently being considered by Council
- Section on Solar Orientation, Energy Efficiency, Views and Shadows





Policy Options - Building Energy Performance Standards via Rezoning

- Rezoning application creates opportunity
- Council is not required to grant a rezoning, yet can allow rezoning and exercise its discretion for what land use and density are permitted on the site.
- Sometimes municipalities accept additional amenities (e.g., energy efficient building features) in connection with rezoning.
- Staff bargaining; Council discretion.
- Amenity secured by a LTA covenant.
- This tool can apply to all building types.

Example - Municipality of Bowen Island

- Developed a Council rezoning policy that requests Built Green™ “Gold”, and EnerGuide for New Houses 80 for new residential development





Policy Options - Incentives

- Rebates on building permit fees for “green” buildings (no cross-subsidy)
- “Top of the pile’ or “fast track” permit processing
- Match builders with utility incentive programs
- Reinforce with recognition and/or awards programs
- This tool can apply to all building types.

Example District of Saanich

- Priority permit processing, up to 30% rebate on building permit fees, designated an employee as an energy adviser
- Since Sept. 2007 about 70 builders taken advantage of the free one hour energy advisor consultation and 20 homes registered in the green building stream, for a potential rebate. Most are going Built Green Gold (i.e. EG 77)





Policy Options - Revitalization Tax Exemption Bylaw (for Energy Efficiency features)

- Financial incentive (tax holiday) for specified area or specified building standard.
- May reinforce with recognition/awards program.
- This tool can apply to all building types.



Example - District of Maple Ridge

- Offers a property tax exemption for high-rise residential development that occurs within revite area pre-designated by bylaw
- Residential development that meets basic criteria is eligible for a two-year tax exemption. Developments that are LEED® Silver, Gold or Platinum qualify for a four-year tax exemption.

Property Tax Exemptions for Designated High-Rise Residential

Year	Basic Exemption	Green Exemption
1	100%	100%
2	50%	75%
3	0%	50%
4	0%	25%



Policy Options - Density Bonusing

- LGs permitted to grant additional density where specified amenities are provided.
- Need to consider the impact of greater density, and how much ‘bonus’ required to entice developers.
- Squamish is in the process of developing a downtown neighborhood plan and a new zoning bylaw. Zoning for the downtown area will likely max out at 4-6 floors. There may be some room for “bonusing” but not as much as in metropolitan areas.
- This tool can apply to all building types.



Example - SFU UniverCity Community Trust

- Developed a green building bonus (w/ City of Burnaby, which has regulatory jurisdiction) that allows an additional density for:
 - Enhanced stormwater management (5% floor area ratio (FAR) bonus)
 - Enhanced energy efficiency (5% FAR bonus)
 - Alternative energy systems (10% FAR bonus)
- Verification by an approved green building consultant is required (through a three-phase verification procedure (preliminary permit approval, building permit and occupancy permit)).



Policy Options - Phased Development Agreements

- Local governments may enter into a PDA with a developer on adoption of a bylaw
- PDAs enhance local governments' scope to negotiate amenities, specifically authorizing them to “freeze” zoning for a developer into the future.
- Additional terms and conditions of PDAs may include:
 - The inclusion of specific features in the development [e.g. could include green buildings];
 - The provision of amenities [e.g. could be energy efficiency related];
 - The phasing and timing of the development and of other matters covered by the agreement;
 - The registration of covenants;
- Tool can apply to all building types, and to large and small (even site level) projects.
- Best suited to large, complex, long-term projects.



Policy Options - Heat Loss Calculation for Building / Heating Permit

- Local governments deliver and enforce the BC Building Code. As per s. 9.33.5.1(1), local governments should include a requirement for a heat loss calculation in their municipal building bylaw.
- A heat loss calculation ensures the building's heating equipment meets the actual heating requirements of the structure and avoids installation of "oversized" furnace or hydronic equipment.
- This tool can apply to all building types.

Example - City of Burnaby

- The City of Burnaby requires to obtain heating system permit for a building permit.
- In the case of hydronic (hot water) heating systems, applicants are required to provide an appliance selection worksheet and a heat loss summary worksheet (among other things).
- If a forced air heating system is to be installed, applicants are required to provide an appliance selection worksheet, a heat loss summary worksheet, a supply air duct summary and a return air duct summary as well as adhere to specified guidelines.



Policy Summary

- Squamish's OCP (draft) supports a review of DPA guidelines to incorporate energy considerations, such as solar orientation.
- A rezoning policy should include a requirement for a restrictive covenant. This however adds an administrative burden.
- Building permit fee “grants” and tax exemptions essentially amount to the District subsidizing green buildings. Squamish's OCP (draft) indicates the District will consider incentives for high performance buildings. Could also support carbon neutrality commitment.
- Density bonusing - analysis is required to ensure net benefit to the developer and energy efficiency doesn't trump other ‘amenities’.
- Phased Development Agreements likely best applied to large, complex developments, e.g. Oceanfront, Waterfront. Probably not well suited to rest of Squamish.



Development Permit / Rezoning Checklist

- Completion of the checklist is required as part of a development permit application and/or an application for an amendment to the zoning bylaw (rezoning).
- Checklist is mandatory, action is not mandatory. Developer friendly.
- Not well suited to SFD.



Checklist cont'd

All applicants for rezoning and development permits in the City of Port Coquitlam are required to complete a Sustainability Checklist.

Key attributes

- The checklist employs a scorecard approach rather than a pass/fail approach.
- Point system is more “measurable”, easier to evaluate
- Supplementary completion of the LEED-NC 1.0 Project Checklist required

Submission and review process

- Staff review the checklist, discuss further with the proponent, prepare a final checklist and submit with application.





Checklist cont'd

All applicants for rezoning and development permits are required to complete a Smart Growth Development Checklist.

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City of New Westminster
British Columbia, Canada

Key attributes

- The checklist is not a pass/fail testing instrument. Proponents are asked to provide yes/no and qualitative answers.
- The checklist's scope is broader than energy efficiency.

Submission and review process

- Submitted as part of the pre-application process.
- Staff provide comments.
- Checklist resubmitted with the final application.
- The checklist is forwarded to the Advisory Planning Commission and design panels, and attached to staff's report to council.



Checklist - Discussion

- The checklist assists Council determine whether the development is striving to meet broader community objectives (e.g. social, economic, environmental well-being).
- Changes to municipal bylaws are not required. A council resolution recommended.
- New Westminster conducted a six month review. There was little or no adherence to Smart Growth practices, and in particular to environmental objectives. In most cases, developers suggested they would consider environmental practices “at a later date” yet did not.
- Port Coquitlam’s checklist is a point-based and said to be more effective. This is not confirmed with verifiable data.
- Both New Westminister and Port Coquitlam use an iterative review processes.
- Checklists are an educational, not a regulatory tool, therefore there is no legal recourse if checklist promises not fulfilled.
- Ability of checklist to induce change is linked to Council’s willingness to incorporate into decision making.



Checklist - Discussion cont'd

- The District of Squamish developed a draft Smart Growth checklist. More of a Q&A format with only one reference to energy efficiency.
- Port Coquitlam's checklist requires the developer to complete a supplementary LEED Canada-NC 1.0 Project Checklist. The checklist has a stand-alone section on Energy and Atmosphere.
- New Westminster's checklist does not require the LEED checklist but includes 2 specific questions on energy use: Energy efficiency and use of renewable energy.
- Two possible approaches:
 - More specific questions on energy efficiency
 - Defer to supplementary checklist, e.g. LEED (part 3), BuiltGreen (part 9)
- Using LEED and Built Green would likely require staff training in each area.



Recommended Next Steps - Energy Policy

Energy Efficiency Policy

- We recommend the District and stakeholders select a policy/policies for further development.
- Assess policy according to pre-determined evaluation criteria.
- For each policy we will provide legal context and sample language.
- We will contextualize each policy within a long term strategy.
- Note: some policies will require additional analysis to develop. E.g. an effective density bonus policy requires further analysis into growth impacts, real estate values, impacts on other desired amenities, etc. This would have to be completed as part of a subsequent analysis.



Policy Comparison

Policy	Application	Pros	Cons
Development Permit Area Guidelines	All except low density residential	Can address passive solar	Questionable interpretation of legislation, expensive to develop and update, guidelines only
Rezoning Policy	Buildings in rezoning process	Flexible, has 'teeth'	Additional administrative layer, additional costs to developers
Building Permit rebates	Open to all types	Carrot approach	Requires the District to subsidize green buildings
Tax exemption bylaw	Open to all types	Carrot approach	Requires the District to subsidize green buildings
Density bonusing	Open to all types	Palatable to developers	Competes with other amenities, e.g. affordable housing, libraries, etc
Phased development agreements	Open to all types	Flexible, offers certainty to both developer and LG	Each agreement requires a bylaw and public hearing to consider
Heat loss calculation	All	Required by BCBC	Required by BCBC
Energy efficiency checklist	Buildings part of rezoning or DP process	Developer-friendly	Cannot be enforced.



Recommended Next Steps - Checklist

Energy Efficiency Checklist

- Options:
 - Add several energy specific questions to the draft Smart Growth checklist. This option is probably the least onerous but would likely yield the least effective outcome
 - Adopt the LEED (part 3) and BuiltGreen (part 9) checklists as a supplementary checklist. The LEED and BuiltGreen checklists are updated regularly, ensuring currency and reducing burden on staff.
- If option 1, scorecard approach, yes/no approach, or questionnaire?



Policy Criteria

The following criteria would be useful in the evaluation of an Energy Efficiency Policy or suite of policies:

Criteria	Metric
Administrative burden on the District of Squamish	Qualitative
Administrative burden on Developers	Qualitative
Energy savings to reach target (EG80 or 25% better than MNECB)	kWh and/or GJ
Incremental capital cost imposed on developer	\$/m ²
Incremental life cycle costs associated with upgrade	\$/m ²
GHG reductions	MT/m ²
Enforceability	qualitative
Opportunity for updating the standard over time	qualitative



Next Steps - Education and Recognition

- Successful premium building standard programs involve education and recognition.
- Educational materials will be developed to reinforce the new policies that will be developed.
- During step 2 of this strategy development process as policies are more clearly defined the following materials will be developed:
 - New Housing Best Practices Guide - to provide guidance to builders going beyond the BC Building Code. Audience: home builders.
 - New Housing Construction Guide - designed to help developers meet the new policy Squamish implements. Audience: all.
 - Energy Efficiency Learning and Communication Materials - technical resources to support Squamish staff.
 - Energy Efficiency Construction Resources List - support material intended for the general public.
- Leadership could be recognized by developing a “Squamish Sustainability” certification that could be applied to building site signage and promotional material for that specific development, and similarly published by the DoS. Top developments could also be recognized through awards.