AGENDA ADDENDUM

PUBLIC HEARING OF COUNCIL

December 14, 2010
7:00 p.m.
Council Chamber, Municipal Hall
355 West Queens Road,
North Vancouver, BC

Council Members:
Mayor Richard Walton
Councillor Roger Bassam
Councillor Robin Hicks
Councillor Mike Little
Councillor Doug MacKay-Dunn
Councillor Lisa Muri
Councillor Alan Nixon

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THE FOLLOWING LATE ITEMS ARE ADDED TO THE PUBLISHED AGENDA

4. REPRESENTATIONS FROM THE PUBLIC

1. Email: Cathy Adams.

2. Presentation: Corrie Kost.
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Dear Mayor Walton and Members of Council

I am unable to attend this Public Hearing tonight. I would have benefited from hearing a presentation on the issue of a Green Building Strategy, especially if there were also an opportunity to ask questions, etc. - (which does not happen in a public hearing, anyway).

I have reviewed documentation from previous presentations and council workshops on this Green Building Strategy. Since video does not exist, there is only the bare bones slide presentation and minutes from these meetings available to me. I do note that in the April 12th/2010 workshop, the minutes reflect that council seemed to assume, or request, that some form of public consultation would take place.

**Public consultation prior to an OCP and zoning amendments to the bylaw;**

This did not happen, to my knowledge. It is apparent that perhaps there was significant consultation with the building industry.

It is also unfortunate that our community associations no longer get notification about most District initiatives such as bylaw amendments, changes to the OCP, etc. It used to be the case that the District would make a better effort to ensure the community was aware of such items. In the case of this green building strategy - it affects every property in the District.

My reaction to these changes to the OCP and Zoning Bylaw is that the use of density bonusing is not as appropriate as other incentives, such as reductions in fees and other costs associated with development. Could an acceleration in the timeline for approvals, etc. by the District be proposed, or was this rejected for some reason? The last point of Council discussion in the minutes from April 12th seems to reflect this type of concern, as well. However, it's impossible to know exactly what was behind the note on council discussions!

**Disagree with the mechanisms – come up with something simple i.e., rebate for 50% of development cost instead of lists and options.**

The density bonus associated with the bylaw amendment is significant, perhaps especially in the case of single family houses. Haven't we worked in the District to get away from ever larger single family houses?

I went looking for what the Advisory Design Panel might be thinking. They were to consider the issues associated with the changes to these bylaws in November. Unfortunately, if they did, the minutes are not yet online. I would have been interested to know of any issues or concerns they brought forward in their deliberations. The staff report for tonight's public hearing just says that the minutes will be available to council prior to tonight. It would have been good for that to be readily available to the public, as well.
As I said, it would have been beneficial to be able to hear a presentation on this issue, listen to council discussion and questions, and have an opportunity to reflect on the complex issues involved. On that basis, and the fact that many of the aspects of the bylaw amendment seem problematic to me, I do not support these changes to the OCP and Zoning Bylaw. I also object to this Public Hearing, the subject of which impacts everyone in the District, being held this close to Christmas - when many residents are necessarily occupied elsewhere.

Thank you for considering my input. I hope that council will ensure that proper steps have been taken prior to approving such significant changes to the Official Community Plan and Zoning Bylaw.

Cathy Adams
December 14/2010

**Bigger is not better – even with improved energy efficiencies**

**Re:** Bylaw 7829 – A bylaw to amend the DNV Zoning Bylaw 1965 (Bylaw 3210). Green Building Regulations

**Position:** Opposed to sections referring to Single-Family Homes

**Recommendation:** That Single-family homes’ density bonus be rejected

**Rationale:** This bylaw is contrary to true “Sustainability”.

There are two aspects of the bylaw I wish to address.

a) Concerns about sections 4C01 & 4C02
b) Concerns about section 4C03

---

a) Relating to sections 4C01 & 4C02 I have concerns that the aesthetics have not been addressed. In particular, the proposed allowed structures should not be viewable from the street, particularly for **Heritage designated home**. As well, I am concerned that protection of right to sunshine has not been addressed. Specifically the potential **conflict between neighbours relating to growth of trees and operation of solar panels**. Balancing of these competing interests needs to be clarified in law.\(^{(1a,b)}\)

b) Relating to section 4C03 I will argue that a bonus (increased Floor Space Ratio) for single family homes is both unwarranted and counterproductive in terms of sustainability and the wishes of the neighbourhood to regulate the maximum size of homes. The details follow.

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**The failings of the Energuide**

Energuide is based on a single measure – the energy efficiency of the home. It does not take into account the energy used to produce the home, nor all sources of energy consumed in the home. A home which is built today to meet a certain Energuide is likely to not meet that Energuide in the future.

---

**Covenants**

The requirement of a restrictive covenant and a performance security is outlined on page 2 of the staff report. It is not clear if such a restrictive covenant will be required for new single family home which is not related to a new subdivision. It is assumed that the same requirements will be mandatory for a new single family home requesting a increased floor space bonus. These type of covenants, be they covered under sections 4C03 subsections (1) or (2) would, in my opinion, be unworkable attempts to ensure continued energy efficiency of an Energuide built facility. In addition it would result in a make work for our staff, adding further long term burden on the taxpayer.
Certainly clarity of this covenant requirement is needed, especially as it relates to new single family homes NOT subject to a subdivision, wishing to benefit from the same program as those single family homes resulting from a new subdivision.

<table>
<thead>
<tr>
<th>EnerGuide Rating Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of House</strong></td>
</tr>
<tr>
<td>Older house not upgraded</td>
</tr>
<tr>
<td>Upgraded old house</td>
</tr>
<tr>
<td>Energy-efficient upgraded old house or typical new house</td>
</tr>
<tr>
<td>Energy-efficient new house</td>
</tr>
<tr>
<td>Highly energy-efficient new house</td>
</tr>
<tr>
<td>&quot;Advanced house&quot; using little or no purchased energy</td>
</tr>
</tbody>
</table>

Note: Natural Resources Canada\(^2\) states that for a brand new house, a rating of 80 or higher is excellent.

**Square footage Matters**

On average, apartments consume much less energy than single-family homes. However, for equal square footage the energy use of single-family homes are on par with energy use of multi-family units.

Money spent on greening will never compensate (on the basis of total environmental footprint) for building more square footage than one needs. Lowering the square footage lowers almost every environmental impact proportionally. Thus, for example, a 2000 square foot conventionally built house would have a lower ecological impact than a 4000 square foot house employing all the energy saving features.

Do we need all that space? This is largely a question of good design. Many rich people are quite happy cruising the world in a yacht with less than 200 square feet per person. A target of say 400 square feet / person seems eminently doable for housing on land. Quality, not quantity is the answer.

The average size of a home in Canada has doubled in the last 30 years, despite the size of families shrinking. The homes’ square footage per person in Canada has tripled since the 1950’s. Has this increased our quality of life in the same proportion? I would hazard a guess that it has not.

Although the most ecological solutions are often the cheapest long term solution, developers avoid this because it negatively impacts their long term livelihood. Builders almost always prefer bigger, not smaller buildings. The same thing was happening to automobiles, where it was more profitable to make big SUVs than small cars – until finally the energy crunch hit.
Bigger homes, loaded with extra features, improves profit margins. It is in the interest of the construction industry to push for laws allowing bigger homes and brainwash us all that we need all that stuff. **It should be noted that no general public meeting (but lots with “stakeholders”) were held to draft this new bylaw.**

Bigger homes lack “warmth” – a “soul” would be a better word – which comes from a high level of craftsmanship that is only affordable in smaller homes. I suspect that many of the bigger homes in the district have already found that bigger is not better and consequently have “downsized” by closing off bedrooms and areas they don’t, and will probably never, need.

From a global perspective, it is clear that large homes are not sustainable. Homes in most of the world are smaller – often way smaller, than what we allow (and thus encourage) here. Better use and design of space, not bigger spaces, is what is needed. With all our busy lives it saves on the need for domestic help as well!

**Cost of Energy-efficient Construction**

A US report by the Building Codes Assistance Project (BCAP) indicated that the average incremental cost of constructing a new home to meet the 2009 International Energy Conservation Code (IECC) comes to about $800 – which has a payback in only three and a half years! No further incentive needed here.

Finally, why on a Tuesday evening, close to Christmas, are we deciding on an issue which ignores literally years of community efforts in establishing neighbourhood zoning and maximum acceptable home sizes – all on the basis of a questionable green building strategy.

Doing things right is efficient, but more importantly, doing the right things is more effective.(3)

Please reject this part of bylaw 7829 AND refer the matter to a full public meeting on the issues.


(3) Paraphrase of a quote by Peter F. Drucker “Doing the right thing is more important than doing the thing right”

Yours truly,

Corrie Kost
2851 Colwood Dr.
N. Vancouver, V7R2R3
Tel: 604-988-6615
From Modest to McMansion
The average square footage of a new single-family home

<table>
<thead>
<tr>
<th>Year</th>
<th>Square Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>983 sq. ft.</td>
</tr>
<tr>
<td>1970</td>
<td>1,500 sq. ft.</td>
</tr>
<tr>
<td>1990</td>
<td>2,080 sq. ft.</td>
</tr>
<tr>
<td>2004</td>
<td>2,349 sq. ft.</td>
</tr>
</tbody>
</table>

Source: National Association of Home Builders (Housing Facts, Figures and Trends for March 2006)

Is the McMansion Era Over?
Americans’ Ideal Home Size

Density Bonusing  - more notes by Corrie Kost 14 Dec/2010

http://www.toolkit.bc.ca/quick-starts-medium-and-large-communities  -- BC Climate Action

Density Bonusing is a land use policy tool that permits local government to allow increased density in exchange for a contribution towards a community amenity or other benefit. Community amenities and benefits typically include parks, day care or affordable housing, but can also include climate action items such as alternative transportation investments and low-emissions buildings. From a climate action perspective, Density Bonusing is doubly beneficial, as higher densities can create opportunities for transit service, viable retail uses, and infrastructure savings. If used in conjunction with brownfield or infill development policies, Density Bonusing can also help centralize urban growth, which also helps reduce people’s need to drive. For more information, see Density Bonusing. (follows below)

http://www.toolkit.bc.ca/tool/density-bonusing

Density Bonuses offer developments a level of density that surpasses the allowable Floor Area Ratio (FAR) in exchange for amenities or housing needed by the community. These amenities typically include parks, heritage preservation and affordable housing, but offering increased density in exchange for greener development can also be seen as an amenity to the community [1].

Density bonuses must be established in zoning bylaws that set out the specific conditions needed in order to receive the increased FAR.

The impacts of increased density on services and the neighbourhood should be carefully considered. When creating a density bonus program, local governments should:

- clearly establish the purpose of the program
- establish a maximum overall density in the Official Community Plan or Local Area Plan
- concentrate density in strategic areas to encourage transportation choice
- calculate the value of the increased density and what amenities can be bought with it
- define and prioritize amenities or housing needed by the community [2]

This incentive tool is less effective in communities where density isn’t valued by developers or where land is more affordable and developers are content to build out instead of up.


=====================================================================

Alternate Approach to seeking compliance with base Energuide Standard

In the case of a straight building permit for a new home compliance with the BASE standard is voluntary. Apparently, according to legal opinion provided to DNV, they lack the authority to enforce the new standards on one rebuilding a home. An alternate approach taken by some other jurisdictions is to downzone all existing residential zones (for example to half of existing FSR) and then allow the full FSR only when one adheres to the new Energuide standards. See for example section 3.1.3 of

=====================================================================
3.1 Require improved energy efficiency standards for larger dwellings

3.1.1 Redefine all zoning areas on Salt Spring to require new dwellings that exceed 1,500 sq ft in area to meet EnerGuide for New Houses - EGNH 80 plus Built Green Gold or better [and a written description of C2C elements in the dwelling].

Most of the energy used by a building is used during operation. Larger homes tend to use more total energy on both an absolute and on a square foot basis. If we are to meet the Salt Spring Community Energy strategy target for new homes, all new houses built between 2007 and 2012 must be EGNH 80 or better. Any local government is very limited in terms of what it can do to require building standards greater than the BC Building Code. The province is seeking to introduce standards of EGNH 80 for all new homes by 2010.

One option currently available to the Trust to enable higher energy (and other environmental building standards such as rainwater catchment) to be applied to new homes on Salt Spring would be to limit the size of all new dwellings, unless they met certain energy/environmental standards. The Island Trust Discussion Paper (March, 2006, by John Gauld) has suggested an island-wide maximum allowable house size of 1,884 sq. ft, with an as-of-right allowable area increase on proof of design meeting these standards. This would be easy to administer, and would provide clarity for builders regarding the required environmental standards. If the minimum size was set low enough, most new homes would need to comply with the enhanced standards.

1,500 sq. feet is the suggested cut off point because it allows a modest three bedroom family home to be constructed without having to meet the enhanced standards. A larger maximum allowable area would be less effective in capturing the smaller dwelling units targeted at the retiree market.

Compliance could be effected through a performance bond, which would be forfeited if the home failed to receive the required third-party certification on completion. The labelling and certification procedures for EGNH and BuiltGreen are established in BC and are administered through CHBA BC.

3.1.2 Redefine all zoning areas on Salt Spring to require new dwellings that exceed 3,500 sq feet in area to meet EnerGuide for New Houses - EGNH 83 plus Built Green Gold plus include one or more renewable energy components to provide a minimum of 20 GJ (5500 kWh) per year.

The intent is to introduce a sliding scale such that larger homes would offset the larger quantity of energy they consume by generating it on site from non-GHG producing renewable sources. Allowable renewable sources include solar thermal systems, photovoltaic systems, micro hydro systems, and wind generators. Wood boilers or furnaces should not be eligible because of local air pollution issues. The LTC may wish to include non-energy related requirements such as rainwater catchment.

3.1.3 Redefine all zoning areas on Salt Spring to require existing dwellings to which an addition is being added such that the total floor area exceeds 1,500 sq feet to meet EnerGuide for Houses - EGH 72 or to increase their EGH rating by 10 points.

Salt Spring's older housing stock consumes more energy than new homes, partly because of numbers, and partly because older homes are generally poorly insulated. The Salt Spring Community Energy strategy target is 20% of all existing homes on Salt Spring retrofitted for energy conservation by 2012. The same mechanism described in 3.1.1 can be used to require, at the building permit stage, a demonstrated improvement in performance. An EGH 'A' rating would be submitted with the permit application. An EGH 'B' rating would be supplied on completion of the work. The required target of 72 represents average BC new construction. In other words, the homeowner is required to bring the house up to the equivalent performance of standard new construction.

Because some houses on Salt Spring have very poor thermal performance, to bring them up to EGH 72 could present a hardship. Therefore an alternative method of compliance would be to raise the EGH rating by a specified number of points. Ten points is suggested as a minimum. Ten points represents an average
under the EGH rating system for Vancouver Island. Compliance could be effected through a performance bond, which would be forfeited if the home failed to receive the required third-party certification on completion. The labelling and certification procedures for EGH are well established in BC and are administered through City Green Solutions Society and various private delivery agents. Modest financial incentives for homeowners and landlords are available through federal and provincial governments.

Note that providing density bonussing for energy efficiency may well contradict density bonussing for the purposes of providing affordable housing. [http://ginsler.com/sites/ginsler/files/socio046.pdf](http://ginsler.com/sites/ginsler/files/socio046.pdf) The density bonus program should not become a “catch-all” mechanism for all public objectives. An interesting report covering many aspects of density bonussing (but for which I disagree that existing zoning should be retained as the base for the program) is available at [http://www.ci.austin.tx.us/downtown/downloads/Density%20Bonus%20Report%20FINAL%205-11-09.pdf](http://www.ci.austin.tx.us/downtown/downloads/Density%20Bonus%20Report%20FINAL%205-11-09.pdf)


It notes on page 9 that every jurisdiction that decides to use density bonussing to obtain community amenities must answer the same general set of questions:

1. What are the basic principles on which the system should be based and what conditions must exist for the system to be successful?

2. Where are there opportunities to allow bonus density that are likely to be of interest to developers and that fit with community objectives and good planning principles?

3. How should the rezonings needed to allow density bonussing be implemented?

4. What should be the value of the amenity contribution expected in return for bonus density and how should this value be calculated?

5. What types of amenities should be achieved through a density bonussing system?

Note that for Coquitlam, the density bonus applies to all multi-family RA1 zones, allowing Floor Area Ratios to expand from 1.5 to 2.0 and requiring a $25/sq-ft cash contribution for the additional space allowed. [http://www.portcoquitlam.ca/City_Hall/City_Departments/Development_Services/Planning_Division/The_City_s_Density_Bonus_Program.htm](http://www.portcoquitlam.ca/City_Hall/City_Departments/Development_Services/Planning_Division/The_City_s_Density_Bonus_Program.htm)

Surrey has a more integrated approach to encourage clean energies and encourage certain types of developments [http://www.surrey.ca/for-business/6034.aspx](http://www.surrey.ca/for-business/6034.aspx)

**Incentives for Clean Energy Companies**

The City of Surrey provides incentives for new clean energy companies choosing to locate in Surrey:
• Eliminate property taxes for 3 years from the date of occupancy of the company premises;
• Reduce building permit fees by 5% in relation to the construction of the company premises; and
• Reduce the business license fee to $1 for the first three years of company operation.

The City of Surrey is working with industry, government, and academic partners to create a “clean energy hub” to encourage clean energy companies to build and operate their business in Surrey.

Incentives for Surrey’s Economic Investment Zones

To encourage new investment and job creation in Surrey’s City Center and in the Bridgeview and South Westminster areas, the City of Surrey has designated these areas as economic investment zones:

City Centre Investment Zones:

• Business Development Projects valued greater than $10M
  1. No property taxes for 3 years
  2. DCCs Reduced by 30%
  3. Deferred DCC payments
  4. Building permit fees reduced by 50%
  5. Density-bonus waived

• High Density Residential Projects valued greater than $25M
  1. Deferred DCC Payments
  2. Building Permit Fees Reduced by 50%
  3. Density-bonusing waived

Bridgeview/South Westminster Investment Zone

• Projects valued greater than $5M
  1. No property taxes for 3 years
  2. Deferred DCC payments
  3. Building permit fees reduced by 50%

Alternate Suggestions:

• Local governments can offer rebates on building permit fees for “green” buildings (eg. Saanich provide 30% discount)
• Provide priority service for “green” buildings
• Provide guidance on getting incentives for “green” buildings
• Designate an expert employee as an energy adviser
3.11 Adopt a solar access bylaw

The rights of an individual property owner to receive sun on the southern faces—vertical walls and roofs—of an existing building are currently unprotected. A solar access bylaw would restrict the rights of a property owner to the south to construct a new building, or to allow trees to grow, that would shade more than a certain percentage, perhaps 15%, of the southern faces of a building on an adjacent lot.

The intent of such a bylaw is to protect solar access for existing buildings that have south-facing windows (passive solar gains) and/ or have solar installations. It is not intended to force neighbours to top or fell trees because someone wants to build a solar home. The bylaw therefore should not protect the solar access rights of property owners who have not yet developed their property.

Compliance for new buildings would require the building permit department to check adjacent lots before issuing a permit. A simple sun path tool could be used to screen applications, followed by more sophisticated modelling when compliance is in question. Compliance for tree shading would be complaint-driven.

Process:

Fact sheets are a communication tool and promote informed discussions at the public hearings. Unfortunately, little information on this complex issue before council tonight, has been provided to the public.

This re-enforces the argument that these proposed bylaws should be deferred to a time when the public AND council has all the facts, and especially, a more holistic view of the issues involved.
Energy Efficiency & Buildings

A Resource for BC’s Local Governments

Community Action on Energy and Emissions

This Energy Efficiency & Buildings manual provides an overview of local government policy tools and leading civic building operations that advance energy efficiency.

Fraser Basin Council

In partnership with the

Community Energy Association

cae.ca
Acknowledgements

The Energy Efficiency & Buildings manual is a product of the Community Action on Energy and Emissions (CAEE) initiative, developed in partnership with the Community Energy Association. CAEE provides financial and research support to BC local governments and First Nations to advance energy efficiency through local government policy tools. CAEE is an initiative of the Fraser Basin Council, delivered on behalf of the Province of BC and its many partners.

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This manual is for BC local government officials who want to improve energy efficiency in their communities. It provides practical examples of tools in the following areas of energy efficiency planning:

- Energy codes
- Building and equipment energy rating and labelling
- Energy management for civic buildings and operations
- Policy tools to advance energy efficiency in private-sector development

This manual provides case studies to show how various BC local governments have made progress toward energy efficiency.

Section 3, on energy codes, covers examples of energy standards established in federal, provincial and municipal regulations. Section 4, on building and equipment energy rating and labelling, discusses third-party rating systems for commercial and residential buildings as well as energy-using equipment (e.g., computers, furnaces). A discussion of and examples of civic building retrofits, green building policies and equipment purchasing policies follows in section 5. Lastly, section 6 discusses policy tools available to local governments to advance energy efficiency in private-sector development.

Although the provincial government has overall responsibility for the BC Building Code, local governments have many policy-based tools available to help them advance energy efficiency in private-sector buildings. That said, there are statutory limits to what local governments can do, and more enabling legislative authority would allow local governments to optimize their role as a key point of contact in the development process.

Local governments have a vested interest in optimizing the energy performance of civic-owned buildings and operations. In most cases, the local government retains ownership of buildings and energy-using equipment over the assets’ lifetime, and therefore can justify higher incremental capital costs with an attractive return on investment (i.e., short payback periods).

The measures presented in this manual focus on the energy efficiency of buildings. Many communities are complementing them by instituting Smart Growth practices to increase urban density and make better use of transportation infrastructure. Land use and transportation planning are equally as important as building performance in reducing greenhouse gas emissions.

The motivation for this manual evolved out of the Community Action on Energy and Emissions (CAEE) initiative. CAEE provides financial and research support to BC local governments and First Nations to advance energy efficiency through local government policy tools. CAEE is an initiative of the Fraser Basin Council, delivered on behalf of the Province of BC and its many partners. To date, CAEE has engaged 30 local governments through the following four phases:

1 The initiative was previously referred to as Community Action on Energy Efficiency, but was renamed Community Action on Energy and Emissions in order to incorporate renewable energy and transportation-related emissions.
Visit the CAEE website, www.caee.ca, for up-to-date details on participating local governments, policies undertaken by CAEE participants, and project partners. Energy efficiency practices will evolve as additional BC communities participate in CAEE.

CAEE was awarded the Finalist Premier’s Award in 2006/07.

CAEE is continually expanding, with a goal of having 50 participants by 2010.
2 • Rationale for Taking Action

There are a number of reasons for local governments to take action on energy efficiency and community energy management, including the following:

Leadership on climate change – Local governments have direct control over 9 percent of Canada’s greenhouse gas emissions through their own buildings and vehicle fleets and indirect control over 45 percent of Canada’s greenhouse gas emissions. In British Columbia, residential and commercial buildings — those building types local governments have the most influence over — account for 27 percent of all energy consumed and 13 percent of the province’s greenhouse gas emissions. Local governments can make a major contribution to emissions abatement.

Ensuring housing affordability – Energy efficient buildings can use 25 percent to 50 percent less energy than conventional buildings, reductions that translate to significant savings for all residents and in particular those living on low incomes.

Achieving livability through energy management – Community energy management is in many ways consistent with other mainstream sustainability planning schools of thought, including Smart Growth and New Urbanism. Dense, transit-oriented, mixed-use neighbourhoods are fertile grounds for alternative energy technologies, energy efficient buildings, and location efficient development that lessens automobile dependency.

Development process influence – A powerful reason for local governments to take action on energy efficiency is because they can! Local governments are a key point of contact in the development process, interacting with builders and developers from the concept stage through to occupancy.

Economic development and competitiveness – Green buildings make a community a more attractive place in which to live and do business. At the same time, they reduce the capital burden imposed on local governments to service buildings.

Recognition and civic pride – Local government officials who take early action on energy management and emissions abatement are admired by their colleagues, and their actions are a point of pride for local citizens. Leadership begets respect, praise and emulation.
3 • Energy Codes

Few codes regulate the energy efficiency of buildings in British Columbia. There are, however, four significant pieces of legislation to be aware of, as follows:

**FEDERAL ENERGY EFFICIENCY ACT**
The Federal Energy Efficiency Act, first passed by Parliament in 1992, regulates the efficiency of many different appliances and equipment, including fluorescent lighting, transformers, air-conditioning equipment and household appliances. The act covers any equipment that is imported into Canada or shipped across provincial borders. It does not include equipment that is sold in the same province where it was manufactured. For the most part the act sets standards similar to US regulations, which most equipment already meets.

**BC BUILDING CODE**
The BC Building Code stipulates requirements for insulation in residential single-family and low-rise buildings. These requirements vary by region and by type of heating fuel (i.e., electricity or natural gas), and they constitute what is considered standard construction practice. There are no energy efficiency requirements for high-rise residential or commercial buildings in the code.

**BC ENERGY EFFICIENCY ACT**
The BC Energy Efficiency Act is similar to the federal act but applies to all equipment sold within British Columbia (whereas the federal act does not apply to equipment manufactured and sold within BC). Most of the equipment and appliances covered by the act, and the efficiency levels required, are the same as those covered by the federal act. The BC Energy Efficiency Act was updated in 2006; the most significant changes were new requirements for high-efficiency furnaces and windows by 2008 and 2009, respectively.

**VANCOUVER ENERGY UTILIZATION BYLAW**
Because Vancouver has its own charter, it is the only BC municipality with the power to directly implement an energy code. The Vancouver Energy Utilization Bylaw, introduced in 1991, regulates energy efficiency in all commercial and high-rise residential buildings. It is a comprehensive energy code based on ASHRAE 90.1 (see section 4, on standards).

**FURTHER INFORMATION**

- Federal Energy Efficiency Act
  www.oee.nrcan.gc.ca
- BC Energy Efficiency Act
  www.empr.gov.bc.ca
Energy management is critical to becoming a more sustainable community. It permeates all aspects of a growing community, from land use decisions to transportation to building design. Having an energy plan in place, one that includes energy efficiency objectives, will enable a community to better manage the impacts of urban development related to energy, greenhouse gases and air quality, while achieving broader community objectives related to housing, transportation management, job creation and local economic development.

Guiding, facilitating and ultimately leading the community toward a more energy efficient built form is of paramount importance in the face of rising fuel costs and the long-term prospects for maintaining the livability of our communities. The City’s goals and objectives in the Official Community Plan and the implementation of our Local Action Plan (Partners for Climate Protection program) provide the direction and framework for this to occur.

- **Development of the 2002 Official Community Plan.** This plan is based on the integrating theme of becoming a more sustainable community. Further, the plan includes specific energy management objectives that provide the direction and impetus for energy management in the City.
- **Creation of the Lonsdale Energy Corporation and its community energy system.** The Lower Lonsdale neighbourhood, facing significant redevelopment, was selected and designated as an area that would be serviced by the City’s newly created community energy system, run by the City-owned Lonsdale Energy Corporation in partnership with Terasen Gas. This district energy heating utility would serve the growing community through a street distribution system served by a series of mini-plants. Six buildings have been connected to date, with plans for another 14 by 2010.
• Adoption of the Local Action Plan. This plan focuses on cost-effective actions to reduce energy consumption and resulting greenhouse gas emissions. The plan includes both a corporate plan and a community plan, featuring the need for green building policies for both plans in addition to the expansion of the existing community energy system. In February of 2007 the City adopted a LEED® standard for new civic buildings.

• Incorporate energy management objectives in the Official Community Plan. The importance of having political support cannot be overstated.
• Make progress in bridging the information gap, for energy management is not a traditional area addressed by municipalities. The local level, however, is the best scale at which to address these issues, particularly energy efficiency.
• Set targets and measure progress along the way to help keep you on track. For the City this occurs through both our Local Action Plan and our Official Community Plan Targets and Indicators Monitoring Strategy.

A sustainable community will effectively address the issues of energy management and greenhouse gas emissions by implementing Smart Growth principles in land use and transportation planning, and by considering long-term social, economic and environmental considerations when implementing new policies or programs. Our energy management plan provides the framework for achieving these goals in the City of North Vancouver. Energy efficiency objectives, such as building greener buildings, both on a corporate and a community level, are a key component of that plan.

• Sign up for the Federation of Canadian Municipalities’ Partners for Climate Protection program and kick-start your efforts today. In moving through the program’s five milestones, a municipality is forced to reconcile many aspects of energy management, which ultimately results in a more sustainable, energy efficient community. Further, the program requires that you build in targets and report out down the road.
• Start thinking about how your next Official Community Plan can build in energy management objectives, and take steps to introduce the subject to your council and community. In the short term, two key areas to target would include establishing a green building policy for new civic buildings to lead by example and providing information on energy efficiency at the local level. This could mean having information available for local developers and builders about more energy efficient building programs and models for new buildings and renovations. This may include dispelling myths about higher costs by providing information on life cycle costs of different choices.

At the end of the day it is all about making it easier to “do the right thing.” Everyone wants to – it’s just a matter of knowing where to start.

www.cnv.org
www.cnv.org/lec
www.cnv.org/c//DATA/2/107/-CHAPTER%2008%20ENVIRONMENT.PDF
www.cnv.org/c//DATA/2/171/SUSTAINABILITY%20GUIDELINES%20.DOC
www.smartgrowth.ca & www.smartgrowth.bc.ca
www.bchydro.com
www.terasengas.com
www.cagbc.org
4 • Building Standards & Rating Systems

4.1 Commercial / Institutional
ASHRAE 90.1
Model National Energy Code for Buildings (MNECB)
Leadership in Energy & Environmental Design (LEED®)
Other Commercial Rating Systems

4.2 Residential
Built Green™
Other Residential Programs

4.3 Energy-Using Equipment
EnerGuide
Energy Star®

The Vancouver Island Technology Park in the District of Saanich is the first LEED® Gold-certified building in Canada.

Many different voluntary standards and rating systems exist for buildings and energy-using equipment. An awareness of the available systems and where they apply is important, as these often form the basis of local government policies. It is much simpler, from both the local government’s and the developer’s perspective, to reference a well-known standard than to try to develop one from scratch.

A multitude of different standards and labelling programs are available for buildings. Standards generally set a single target level of efficiency, whereas rating systems provide different levels of achievement. However, standards and rating systems often overlap, and in some cases one standard or rating system will be used within another, broader system. This section identifies the more common standards and systems used in BC and highlights some of their key characteristics and the differences among them.
4.1 Commercial/Institutional

ASHRAE 90.1

The ASHRAE 90.1 standard is the world’s best-known energy standard for buildings. Produced by the American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE), it was developed in the 1970s and is updated regularly. ASHRAE 90.1 is a comprehensive, whole building standard, with sections for lighting; heating, ventilating and air-conditioning (HVAC); and architecture. It is a flexible standard, with both minimum requirements and the ability for trade-offs (e.g., better lighting in exchange for more glass area). ASHRAE 90.1 is written in code-style language, for easy adoption by governments and regulating authorities.

The most recent version of ASHRAE 90.1 is 90.1-2004. A new version will be released in 2007. ASHRAE 90.1 has been adopted in some form by a majority of US states and is also used by other rating systems. At the time of writing, Vancouver was in the process of adopting the 2004 version, and LEED® (see below) references an older version, 90.1-1999.

MODEL NATIONAL ENERGY CODE FOR BUILDINGS (MNECB)

The Model National Energy Code for Buildings (MNECB) was released by the National Research Council Canada (NRC) in 1997. It is a comprehensive, whole building code, similar to ASHRAE 90.1. In fact, many of the efficiency standards were taken directly from ASHRAE 90.1-1989. However, no province has ever adopted it, no jurisdiction is currently using it, and it has not been updated since 1997. NRC is currently considering an update, but no timeline has been set.

Despite this situation, the target of 25 percent improvement over MNECB, first used in the now-cancelled Commercial Building Incentive Program (CBIP), has become a de facto standard, used in both LEED® and the BC government’s targets for efficiency of new buildings under the BC Energy Plan.

LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN (LEED®)

Leadership in Energy and Environmental Design (LEED®) is a rating system developed by the US Green Building Council (USGBC), adapted and managed in Canada by the Canada Green Building Council (CaGBC). It is a broad, comprehensive environmental standard for green buildings that includes not just energy, but also site selection, building materials, water conservation and indoor air quality (IAQ).

LEED® has been extremely successful since its release in 1998, becoming the best-known and most widely referenced building rating system. LEED-NC (new construction) is the original and most popular LEED® standard, which applies to new commercial and high-rise residential construction. There are also LEED® standards for existing buildings, new homes and new neighbourhoods, some of which are still in pilot phase.

All LEED® standards use a point system, with certification levels of Certified, Silver, Gold, and Platinum; there are minimum requirements in each area. For the Canadian version of LEED-NC, the energy requirements are based on either MNECB or ASHRAE 90.1-1999, with a minimum efficiency of 25 percent higher than MNECB for LEED® certification.

Some complaints have been levelled against LEED®, including the cost of certification and the complexity of verifying compliance. In spite of this, the number of LEED®-registered projects continues to grow exponentially.

OTHER COMMERCIAL RATING SYSTEMS

There are several other commercial rating systems in addition to ASHRAE 90.1, MNECB and LEED®, although none have the same profile or relevance to local governments as these three.

Green Globes is an online environmental rating system for existing buildings, developed by the UK-based RICS Foundation. It generates a score from 1 to 100 as well as a comparative score against other buildings. It is a self-assessment, although third-party verification can be arranged, which entitles the building to display a Green Globes rating.

The Building Operators and Managers Association (BOMA) runs a voluntary program for existing commercial buildings called BOMA Go Green. It covers energy efficiency as well as issues such as recycling, water conservation and material selection. The basic program emphasizes audits and the establishment of environmental policies. A Go Green Plus program addresses more specific building components and uses the Green Globes rating system.
4.2 Residential

**ENERGUIDE FOR HOUSES / ECOENERGY**

EnerGuide is a rating system for houses, developed by Natural Resources Canada (NRCan). It can be used to rate either new or existing houses, and can also be used for low-rise multi-family residential buildings. An incentive program for existing homes, also called EnerGuide, was cancelled in 2006 and replaced with a new program called ecoENERGY (full name is ecoENERGY Efficiency Initiative), while EnerGuide, the rating system for new houses, continued. This has led to some confusion over the names.

The EnerGuide rating system still exists and is the same for both new and existing houses. EnerGuide ratings range from 1 to 100 on a non-linear scale. An average existing home will have an EnerGuide rating of 58 to 68, while new homes range from 71 to 76. No standards or certification levels are associated with EnerGuide; it is simply a rating of the home’s energy use.

**R-2000**

R-2000 is another NRCan program to certify the most energy efficient homes in Canada. Adoption of the program has never been overwhelming, but it has played an instrumental role in developing energy efficient construction techniques. Although focused on energy, R-2000 also takes into account water use, air quality (IAQ) and building materials. The energy rating for an R-2000 home is equivalent to EnerGuide 80 or higher.

**BUILT GREEN™**

Developed by the Canadian Home Builders Association (CHBA), Built Green™ is an industry-driven program that certifies environmental performance for new houses and low-rise residential buildings. (A pilot is underway for high-rise residential.) Built Green™ addresses energy through the use of EnerGuide ratings, while using a points scoring system for other environmental features, such as water, waste, materials, IAQ and developer business practices.

The strengths of Built Green™ are its low cost, simplicity and use of a recognized energy standard (EnerGuide). The program has received some criticism that its standards are not high enough, with the Bronze level being similar to current construction practices.

**OTHER RESIDENTIAL PROGRAMS**

LEED® for Homes is similar to the LEED-NC standard, but designed for houses and low-rise multi-family residential buildings. It has been running as a pilot for two years and is expected to launch in the United States in 2007. A Canadian version is expected for 2008.

REAP (Residential Environmental Assessment Program) was developed by the University of British Columbia, and it is mandatory for all residential construction on the UBC campus. It is applicable to both low-rise and high-rise multi-family buildings. Based on LEED-NC, REAP is adapted for a residential focus, with simplified compliance and reporting. The assessment guide is available online and is freely available for anyone to use.

4.3 Energy-Using Equipment

Major equipment, such as furnaces in houses or chillers in commercial buildings, is accounted for within the various building rating systems. But other equipment, such as office computers or home appliances, is not usually considered. For such equipment there are other rating systems available, which can be useful in developing policies relating to energy efficiency.

**ENERGUIDE**

EnerGuide, the rating system for houses, is also a program developed by NRCan for rating major appliances. All appliances in Canada are required to display an EnerGuide label showing their estimated energy consumption. Individual models can be compared online at the EnerGuide website.

**ENERGY STAR®**

Energy Star® is an international rating system for all kinds of energy-consuming products. Almost all major equipment is rated under Energy Star®, which identifies products with the highest level of efficiency. Depending on the product, this may be between 10 percent and 66 percent more efficient than the average for the product class. Energy Star® endeavours to make sure that rated products are widely available, proven technologies and cost-effective over the product life. In Canada, appliances that meet the Energy Star® criteria have an Energy Star® logo on the mandatory EnerGuide label.
How do different ratings compare?

It can be quite difficult to compare rating systems with regards to energy, let alone with regards to other environmental parameters. This is because there are many different sizes and types of buildings, and different ways to meet a given standard. However, some attempts have been made to compare different standards to each other and to current BC construction practice.

Residential rating systems usually use EnerGuide as the energy rating, which provides consistency. However, the EnerGuide rating is not linear, which complicates things somewhat. Home retrofits under the EnerGuide program have shown that the typical existing BC home ranges from EnerGuide 58 to 68. New homes built to code rate between EnerGuide 71 and 76, depending on the region of the province. Analysis done by the provincial government indicates that improving a house from EnerGuide 73 to 79 would result in a 29 percent reduction in energy consumption. The graph top right compares different residential standards, with an estimate of the relative energy savings.

Commercial ratings tend to use either MNECB or ASHRAE 90.1 as their energy standard. Several studies have compared these standards against each other and against current construction practice. Such comparisons are difficult, for the standards are very flexible in their requirements and individual building types can vary significantly. The results should not be considered exact for all buildings. The graph at right compares different standards for typical commercial/institutional construction, again with an estimate of the relative energy savings.
I became a grandfather for the first time in March 2007. This makes climate change and energy conservation personal and for me highlights the critical need to leave this Earth in better condition than it is now — a tall order. Thinking more locally, Vancouver Island imports most of its energy from the mainland, and we have come close to having brownouts from peak electricity demand. We, on this island, need to reduce the peaks in consumption of electricity and also reduce our overall carbon footprint.

- Joining the Federation of Canadian Municipalities’ Partners for Climate Protection program (1998)
- Adopting a Municipal Green Building Policy requiring LEED® Silver or Gold certification for all new municipal buildings (2005)
- Joining the Community Action on Energy Efficiency program and developing a private-sector green building incentive program (2006)

- Clearly identify the barriers to green building or energy efficiency — whether they are people, attitudes, legislation or lack of resources.
- Be strategic. Getting the job done is not always about pushing everyone to agree with the “wisdom” of your ideas.
- Pay attention to timing. Many an excellent initiative has run aground on the shoals of poor timing. However, these days the sea lanes are opening up for relatively clear sailing on climate change initiatives. Now is the time to set sail! (Sailing is carbon neutral, too!)

- Incorporate energy efficiency policies in their Official Community Plans.
- Adopt green building policies for new municipal construction.
- Incorporate a green building/sustainability checklist in rezoning and major development permit procedures.
- Partner with the development industry to craft incentive packages. Developers much prefer incentives to regulation and want to be seen as ahead of the green curve — not behind it.

www.saanich.ca
Energy efficiency improvements are the most cost-effective way to reduce greenhouse gas emissions and help mitigate changes to our climate. Many energy efficiency measures yield great returns on investment.

- Adoption of the City of Vancouver’s Corporate and Community Climate Change Action Plans, with accompanying reduction targets and resource commitments for their implementation
- Early role in having the City establish the Neighbourhood Energy Utility for sustainable district heating systems
- Patience and understanding, Grasshopper!
- Understand stakeholder interests and demonstrate both the feasibility of satisfying the policy as well as the value in doing so.
- Measure the targeted energy use and set short- and long-term targets for change.
- Demonstrate the business case and leadership through City operations – significant energy retrofits of municipal facilities still yield positive net present values!

www.vancouver.ca/sustainability
www.onedayvancouver.ca
When it comes to energy conservation, local governments usually begin with their own buildings and operations. Most have already undertaken some level of energy efficiency retrofit, through BC Hydro’s Power Smart program, the FortisBC PowerSense program, the Terasen Gas energy efficiency programs and/or as part of a local action plan to reduce greenhouse gas emissions. But there are many more opportunities for local governments to take action on energy within their own facilities.

Although cost savings associated with energy efficiency upgrades have usually been the primary driver for energy efficiency projects, they need not be the only one. Related benefits include occupant health and comfort, employee productivity, and reduced maintenance requirements. Perhaps most important is the opportunity to show leadership within the community. As local governments ask more of their citizens with respect to action on the environment, it only makes sense for them to set a good example.
Energy efficiency retrofits of existing buildings are the best way to reduce energy use and greenhouse gas emissions in local government operations. Although some buildings may have had some efficiency upgrades in the past, there is almost always room for improvement. New technologies, increased awareness and changing energy prices often mean that measures rejected in the past as not being cost-effective are viable today. In particular, buildings often have additional savings potential in natural gas, due to rising gas prices and a past emphasis on electrical energy through BC Hydro’s Power Smart program.

The rationale for an energy retrofit can go far beyond just the energy savings. Energy retrofits often introduce new technologies or operating controls that can improve occupant comfort and health. New, energy efficient T8 lighting is a good example of this, providing reduced flicker and hum with improved light quality that can reduce occupant eye strain. Energy retrofits also provide an opportunity to replace aging equipment, and repair or upgrade old systems, while using the energy savings to cover the cost.

Energy efficiency as an investment

Unlike most capital projects carried out by local governments, energy efficiency projects provide a monetary return through the energy savings they generate. This means they can be viewed as investments, rather than as simply expenditures.

As for any large investment, when investing in energy efficiency it is appropriate to perform a full life cycle cost analysis. A life cycle cost analysis takes into account the energy savings over the life of the project, deferred maintenance and equipment replacement costs, and standard accounting factors such as inflation and discount rates.

In spite of being large financial investments, energy projects are often assessed solely in terms of simple payback (cost divided by annual savings), with expectations that paybacks will be very short. This type of analysis does not reflect the true long-term value of a project. More sophisticated indicators such as net present value (NPV) and internal rate of return will more accurately reflect the benefit of the investment. When fully accounted for over their life cycle, projects with simple paybacks as long as 15 to 20 years may still show a positive net present value and be a good investment.

5.1 Energy Retrofits of Existing Facilities

Energy efficiency retrofits of existing buildings are the best way to reduce energy use and greenhouse gas emissions in local government operations. Although some buildings may have had some efficiency upgrades in the past, there is almost always room for improvement. New technologies, increased awareness and changing energy prices often mean that measures rejected in the past as not being cost-effective are viable today. In particular, buildings often have additional savings potential in natural gas, due to rising gas prices and a past emphasis on electrical energy through BC Hydro’s Power Smart program.

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5.2 Comprehensive Retrofits

Local governments undertaking energy retrofits tend to seek quick payback measures in order to keep project costs down. Short-term paybacks may look good at first, but they don’t provide the best long-term return to the owner. And a “slow and steady” approach of retrofitting one or two buildings a year will have serious implications in terms of the higher energy costs for buildings waiting to be retrofitted.

It makes more sense both financially and operationally to undertake a comprehensive retrofit of civic facilities. A comprehensive retrofit is a project that examines most or all of an organization’s facilities, all utilities (e.g., electricity, gas, water), and both short- and long-payback measures.

Although the initial payback may be longer, a comprehensive retrofit will usually have a better financial return when looked at over the life cycle cost. Life cycle costing treats the retrofit as an investment, and considers standard financial investment parameters such as inflation, discount rates, return on investment, and net present value.

Comprehensive retrofits have additional advantages beyond the financial returns. Because they involve all the civic facilities, they result in a coordinated approach throughout. This means consistent lighting and control systems as well as consistent documentation. They may also result in reduced workload for staff, as the project is completed quickly rather than ongoing for years. And the scale of the project will result in lower costs, both in construction capital and engineering design.

5.3 Implementing Energy Retrofit Projects

Energy efficiency retrofits are usually implemented in a similar manner to other retrofit projects: an initial engineering audit and study, followed by design, construction and commissioning. A small, single building project may take six months or less to complete, while a major comprehensive retrofit may take several years. Interim funds will need to be made available to cover the cost of the study and design prior to construction financing.

An energy audit is a detailed assessment of the buildings, their equipment and operation, and the utility bills. It will identify potential energy efficiency measures, predicted savings and estimated installation costs. Energy analysis is a specialized area of expertise, and an engineering firm with experience in this area should be retained. The firm that does the study will sometimes undertake the design and project management of the construction phase as well.
Saanich’s comprehensive retrofit included the district’s largest energy-consuming buildings, such as pools and arenas.

**ENERGY PERFORMANCE CONTRACTING**

Energy performance contracting is a method of undertaking comprehensive retrofits that is gaining popularity across North America. Energy performance contracts are turnkey projects, where all aspects of an energy efficiency retrofit are undertaken by an energy services company (ESCO), including energy studies, design, and project management. The most important aspect of an energy performance contract is that the ESCO guarantees both the upfront cost and the future energy savings. This minimizes the risk to the owner of the facilities.

ESCOs have experience in both the energy analysis and construction management side of a retrofit project, and are then well positioned to maximize savings while minimizing costs. As a turnkey service provider, they can help minimize the complexities and workload for staff in managing a large retrofit project. An ESCO will usually cover the upfront cost of the initial energy study, but it should be clear that this study is not “free”; rather, the cost is rolled into the overall project cost once the project proceeds.

An ESCO makes its profit by charging a markup, similar to a contractor. There are separate markups to cover the cost of energy studies, design, project management, etc. Generally hiring an ESCO will cost about the same as procuring these services separately. ESCOs do not as a rule arrange financing for projects (although in some cases they will), for a BC local government can arrange financing through the Municipal Finance Authority at much more favourable rates. But the energy savings will cover all financing costs, so that there is no net cost to the local government.

The City of Burnaby was the first BC municipality to undertake a comprehensive energy retrofit using an energy performance contract. After extensive work by finance staff in 2003 to develop a business case, the City went through a process of selecting an energy services company (ESCO) to provide a bundle of energy services, including energy auditing, retrofit plan development and oversight of the energy retrofits.

The following facility upgrades were underway in 2004 and completed by September 2006:

- High-efficiency lighting
- Water conservation measures
- Building envelope upgrades
- Thermal pool covers
- Automation (control system) upgrades
- High-efficiency boiler and furnace upgrades

Energy savings are guaranteed through an energy performance contract with the ESCO, with a guaranteed annual savings of $450,000. The project achieved additional energy savings of $360,000 during the construction phase, with a commensurate reduction in CO₂ emissions of 1,481 tonnes annually.

The $5.6-million project was financed by the City of Burnaby through its capital budget, less incentives from utilities and the federal government.

Burnaby has been very pleased with the results of the project and found that the retrofits have generally been carried out with minimal disruption to employees and those using facilities. The energy-saving measures have generated very positive feedback. For example, the new reflective low-emissivity ceilings at Kensington and Burnaby Lake ice arenas have provided not only energy savings but also an overall 30 percent improvement in lighting levels and a harder ice surface. Local hockey players and ice-skaters are very impressed!

**Contact:** Kim Flick, Long Range Planner, planning@burnaby.ca, 604.294.7420.

As part of its comprehensive energy retrofit, the City of Burnaby installed new reflective low-emissivity ceilings at Kensington Arena that save energy, improve lighting and provide a harder ice surface.
5.4 Civic Building Policies

A civic building policy is one in which a local government commits to constructing all new civic facilities to a certain energy or environmental standard. Such a policy is usually linked to a recognized building standard such as ASHRAE 90.1 or LEED®. A civic building policy may also include criteria for undertaking retrofits of existing facilities.

Often, energy efficient or green features are considered an “extra” and not included in a new building’s construction budget. As such, they are often not installed, even though they may pay back many times over the life of the building. The benefit of a civic building policy is that it brings green building features to the forefront, so they will no longer be considered an extra cost outside the budget. They can be automatically incorporated into future designs, minimizing any additional cost. Discussion on the merits of various green building features can occur during the policy’s implementation and will guide its wording.

A good civic building policy should be flexible, cost-effective and of sufficiently high standard to achieve the desired results. It is recommended that it reference a recognized standard (such as ASHRAE 90.1 or LEED®), which will achieve these objectives. A policy might also commit the local government to performing life cycle cost assessments of systems outside the scope of these standards and to providing additional funds to cover the capital cost of these systems where they are proven to be cost effective.

District of Saanich

The District of Saanich has implemented a Green Building Policy. Key requirements of this policy are as follows:

- Meet a standard of LEED® Silver certification for all new civic facilities or additions larger than 500 square metres.
- Undertake life cycle costing analysis for all projects over 500 square metres.
- Provide additional funding for design and capital cost where the life cycle costing shows a return on investment greater than 10%.

Other commitments under the policy relate to renovations, operations and building community awareness. The first new municipal building constructed under this policy is the Saanich Centennial Library (at Pearkes Arena), which opened in September 2007.

Contact: Russ Fuoco, Director of Planning, fuocor@saanich.ca, 250.475.5472.

The Saanich Centennial Library is a LEED® Silver Candidate.
5.5 Civic Purchasing Policies

A purchasing policy commits a local government to buying energy efficient equipment and appliances throughout its operations. The reasons for having such a policy are similar to those for having a civic building policy. A purchasing policy ensures the local government is making long-term cost-effective purchasing decisions, without requiring an assessment of each item. Such a policy is generally intended to cover smaller equipment where it is impractical to perform a life cycle analysis, rather than major building systems. However, it could include a commitment to life cycle cost analysis on larger systems, similar to a civic building policy.

The easiest way to implement a purchasing policy is to reference Energy Star® (see section 4.3). Most equipment and appliances are available with an Energy Star® rating, and they are proven, cost-effective technologies. Plus, there are always a sufficient number of Energy Star® manufacturers to provide competitive pricing and product choice.

One area not covered by Energy Star® is vehicles. Natural Resources Canada does rate vehicles through the EnerGuide program, listing the most efficient vehicles in each class. However, a purchasing policy should not restrict decisions to one vehicle, and therefore a policy would be better to reference a percentage of top performing vehicles. For instance, a policy could state: “Any vehicle purchased shall be in the top 15 percent for fuel efficiency in its class.” Decisions on vehicles are important enough that it may be worth having a separate vehicle purchasing policy or section, including processes for deciding on vehicle type, guidance regarding vehicle fuel choices, and anti-idling provisions.

A purchasing policy should stipulate that its provisions be stated in all specifications and tender documents for equipment. This ensures that the policy is put into action and makes energy efficiency a requirement up front, rather than an extra after the fact.

City of Vancouver

The City of Vancouver has enacted an Energy Efficiency Purchasing Policy. This policy requires the City to purchase energy efficient equipment, supplies and appliances wherever possible. The policy references both Energy Star® and NRCan Office of Energy Efficiency guidelines. A list of applicable products is included, but the policy is not limited to those alone. Lastly, the policy requires that the criteria be included in all specifications.

Energy efficiency is very important because of the direct connection between emissions and air and water quality. In a community like Dawson Creek it is important to manage emissions on a community-wide scale. The negative implications of climate change, air quality, water and land impacts can all be addressed through effective energy policies. As well, there are the economic benefits from community-owned energy systems, highly skilled jobs and increased assessments.

Energy efficiency also has implications for broader social issues such as affordability, seeing as how more efficient homes have lower operating costs. This is especially important for people on fixed incomes and also to provide some protection from energy price inflation.

- **Green Vehicle Policy.** The City committed to reducing its fleet emissions by 20 percent within 10 years. The policy also provides direction on how to purchase and maintain vehicles in a sustainable way, including an idle-free initiative. As a result of implementing this policy, the City is now acquiring more efficient vehicles, using less fuel and emitting less, while at the same time saving money. Through the GVP the City is attributing a cost to carbon emissions ($15 per tonne) from vehicles we are purchasing as part of the life cycle costing process. The idea is to use that fund to expand and support other energy efficiency projects.

- **A Green Power commitment from council.** A strategy was developed as part of the City Energy Plan that focuses, in part, on ways to reduce emissions from electricity use within our own operations. This strategy includes energy conservation, development of our own electricity from renewable sources (such as wind and solar) and partnership with green energy producers, when appropriate.
• Green Buildings Policy. Under development, the policy should be completed by the end of 2007. This policy is modelled on the Green Vehicle Policy, and aims to reduce emissions and lower operating costs from large public facilities. The policy will also provide an opportunity to address issues such as water use, recycling, janitorial considerations, indoor air quality, etc.

• A very thorough baseline analysis of a municipality’s operations, including a review of the economic, social and environmental implications. That information, in our case, provided the basis for future policy development and also raised awareness about the issues.
• Talk about energy efficiency without getting into a political, or religious, discussion about global warming. Mayor and council, who ultimately adopt the policy, need to see the connection between a proposed policy and the community they represent. This is a case where it pays to act locally and think globally.

• Energy efficiency is not a traditional area of expertise in the municipal sector. Thus it is very important to hire the right kind of help. For us it was a case of hiring the best we could afford. Groups such as the Pembina Institute, the Community Energy Association, the BC Sustainable Energy Association and others are well prepared to help communities develop good energy management policies.
• The baseline mentioned above is a good start and will quickly point to obvious areas that require improvement, but it is specific to each community. Building capacity within the organization will ensure a long-term approach to continuous improvement.

www.planningforpeople.ca
www.communityenergy.bc.ca
www.pembina.org
6 • Local Government Policy Tools

6.1 Energy Policy Context
6.2 Energy Management & Local Government Policy
6.3 Community Energy Management – A Conceptual Framework
6.4 Energy Management Objectives in the OCP
6.5 Policies at the Infrastructure & Land Use Level
   Development Cost Charges
   Zoning to Encourage High Density & Mixed Use
   Service Area Bylaw
6.6 Policies at the Building & Site Level
   Development Permit / Rezoning
   Sustainability Checklist
   Development Permit Area Guidelines
   Green Buildings in Comprehensive Development Zoning
   Building Energy Performance Standards via Rezoning
   Incentives for Building Permit Fees
   Tax Exemption Bylaw for Green Buildings
   Density Bonusing
   Review Building-Related Bylaws for Barriers to Energy Efficiency
   Local Improvement Charges
6.7 Policies at the Energy-Using Equipment Level
   Heat Loss Calculation for Building / Heating Permit

As a key point of contact in the development process, local governments have many policy-based tools available to them to influence private-sector development. To assist BC local governments in using these tools, this section aims to:
• Describe the energy policy context within which BC local governments operate
• Outline the relationship between energy-related decisions and local government planning decisions
• Provide practical examples of energy-related policies available to local governments at the land use level, the building and site design level, and the energy-using equipment level.
6.1 Energy Policy Context

In Canada, energy policy jurisdiction is shared between the federal government and the provincial government, with electric and gas utilities operating under the legislative authority granted to them by their respective provinces. The federal government is responsible for the interprovincial or international movement of energy and energy-using equipment. Provincial governments are responsible for energy matters within provincial borders, including trade and commerce and environmental impacts. The electricity and gas market in British Columbia is regulated by the BC Utilities Commission under the legislation contained in the Utilities Commission Act.

In British Columbia, buildings are regulated under the BC Building Code. The Office of Housing and Construction Standards — a branch of the Ministry of Forests and Range — is responsible for the code. Local governments have little authority to require building standards beyond the standards outlined in the BC Building Code; they are limited to an exercise of authority “for the health, safety or protection of persons or property” (Community Charter 2003, Section 53). Since energy efficiency would not likely be considered as within this domain, it is highly unlikely energy efficiency requirements would be considered an appropriate exercise of authority.

Local governments do have jurisdiction in the area of land use and development controls, provided policies, regulations and measures do not attempt to supersede the BC Building Code and/or are permitted within the local government-enabling legislation.

6.2 Energy Management & Local Government Policy

In British Columbia, local governments are considered creatures of the Province, meaning all planning and administrative actions are directed by enabling provincial legislation. With the exception of the City of Vancouver, all municipalities operate primarily within the limitations of two statutes: the Local Government Act and the Community Charter.

The Local Government Act provides municipalities and regional districts with the powers they require to fulfill their purposes and respond to the different needs and changing circumstances of their communities. The Community Charter, a companion statute to the Local Government Act, establishes a core of enabling provisions to municipalities. Rather than try to fully explain the idiosyncrasies of how each statute affects aspects of local government planning, this manual instead identifies the legislative authority pertaining to each energy-related policy.

There is an existing mandate in the Local Government Act for municipalities to include energy management provisions in their Official Community Plan (OCP). Section 875(2) states: “To the extent that it deals with these matters, an official community plan should work towards the purpose and goals referred to in section 849 [regional growth strategy goals].” In Section 849(2)(m) the act states: “[A regional growth strategy] should work towards but not be limited to the following: … planning for energy supply and promoting efficient use, conservation and alternative forms of energy.” Often, policy-makers will look to the OCP for guidance, so including comprehensive language on energy management provides a context for future decisions.

2 The City of Vancouver operates under its own unique enabling legislation known as the Vancouver Charter. Because this statute applies only to the City of Vancouver, planning actions with authority rooted in the Vancouver Charter will not be explored.
6.3 Community Energy Management – A Conceptual Framework

Community energy management combines planning concepts with energy management concepts to optimize the overall energy performance of an urban area.

Community energy management is regarded as “consistent with and in many ways a synthesis of a variety of planning initiatives such as neo-traditional urban design, complete communities and green cities.” These schools of urban planning tend to be motivated more by a concern for local air quality, public amenities, green space and livability than energy throughput of the urban system. Yet the synergies between community energy management and these planning initiatives are relevant because they align many of the objectives of community energy management with more mainstream planning concepts. Common objectives such as higher density and mixed use are often pursued under the rubric of livability, yet also promise energy-related co-benefits.

Energy-related decisions at the municipal level exist within a decision-making hierarchy, where higher-level decisions have the potential to influence decisions further down the hierarchy, as illustrated.

Energy-using equipment (boilers, vehicles, industrial equipment)

Building and site design, industrial processes, transportation modes

Infrastructure and land use (density, mixed use, energy supply infrastructure, transportation network)

Land use and infrastructure decisions are at the top of the hierarchy because they have long-term impacts and influence the energy decisions in the two lower levels. Building and site design decisions often directly influence the choice of energy-using equipment for buildings yet are often subject to previously made land use decisions. Energy-using equipment is at the bottom of the hierarchy because these decisions have less impact and tend to be determined by decisions further up the hierarchy.

As an illustration, consider a district heating system. A district heating system is a highly efficient heat and hot water system that connects the hydronic (hot water) or forced air heating systems of buildings to a central, shared boiler. The shared boiler serves as a mini–power plant, displacing the need for individual furnaces or boilers. District heating systems require distribution infrastructure to deliver the thermal energy to buildings as well as

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A wide range of policies are available to local governments to influence buildings' energy use. A community energy management conceptual framework provides a rational structure for identifying preferred policies and their overall impact and effectiveness.

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+ This quote (p. 1066) and the general concept of community energy management is sourced to M. Jaccard, L. Failing, & T. Berry (1997), From equipment to infrastructure: Community energy management and greenhouse gas emission reduction, Energy Policy, 25(13), 1065-1074. The illustrations are based on ideas presented in the article.
minimum building density and heat demand in order for the energy system to be cost-effective. Ensuring new buildings are compatible with the district system (i.e., system ready) requires appropriate building and site design controls. The building’s heat supply system determines the mechanical and architectural design of the building, which in turn affects equipment decisions at the bottom of the energy decision hierarchy.

There are also three dimensions of the energy-related decision hierarchy: the temporal, spatial and decision-making dimensions, as shown here.

THE THREE DIMENSIONS OF ENERGY-RELATED DECISIONS

<table>
<thead>
<tr>
<th>Energy-related decision</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time</td>
</tr>
<tr>
<td>Land use and infrastructure</td>
<td>Years to decades</td>
</tr>
<tr>
<td>Building and site design</td>
<td>One to three years</td>
</tr>
<tr>
<td>Energy-using equipment</td>
<td>Less than one year</td>
</tr>
</tbody>
</table>

Land use planning decisions, which have a greater influence over the long term, also take longer to implement, require more space, but importantly are within the realm of local government influence. Building and site design decisions can be quick wins, require less space and are often the result of a combination of public and private decision-making. Energy-using equipment decisions require relatively little space and time to implement, yet are not usually within the realm of local governments’ influence.

The community energy management framework provides a useful conceptual model for thinking about energy-related decisions and their effect on energy consumption. The private-sector policies described are categorized according to the three levels of this conceptual model:

• Infrastructure and land use level
• Building and site design level
• Energy-using equipment level

Before delving into specific policies, it is helpful to discuss the importance of including energy-related objectives in the Official Community Plan (OCP). Objectives in the OCP tend to support more specific policy development by giving staff and council the mandate necessary to venture into energy management.
6.4 Energy Management Objectives in the OCP

Inclusion of energy management objectives in the OCP establishes an important policy foundation. As stated in Section 884 of the Local Government Act, all bylaws and works undertaken by a council after the adoption of an OCP must be consistent with the plan. Comprehensive energy management objectives will guide long-range policy development, help steer development-specific negotiations, and provide staff with an overall mandate to explore energy management options in civic and private development.

The energy-related objectives in the OCP will guide staff and the community for the next five to ten years, possibly more. Hence language in the plan should be general enough to accommodate an evolving energy technology sector, yet specific enough to give staff the confidence to pursue robust energy-related measures and planning from Day 1.

**Effective energy-related objectives in the OCP will do the following:**

A. Establish the importance of energy to all aspects of the community's social, economic and environmental well-being

B. Establish the importance of demonstrating leadership in sustainable energy

C. Emphasize the community's global citizenship (linking local efforts to regional, national and international energy and emissions policy)

D. Articulate the relevance of energy management to land use planning and development controls

E. Direct future development to existing village/urban centres

F. Enable staff to explore energy options, both on the supply side (e.g., a district heating system) and the demand side (e.g., neighbourhood and site design)

G. Address the importance of energy efficient municipal buildings and equipment

H. Encourage full life cycle cost assessments for all municipal building energy-related decisions (e.g., heating, cooling or water energy systems)

I. Encourage collaboration with other orders of government (e.g., regional, provincial, federal) and with utilities to address energy and emissions management

J. Establish and support an ongoing Energy Management Committee to advise council and the community on energy-related issues and work with other jurisdictions to explore options

Examples of each of these objectives are provided in the following section. Official Community Plans from different municipalities are referenced in order to provide the reader with a range of approaches and contacts. The best examples of OCP energy sections that include most or all of the above objectives are the City of North Vancouver’s OCP (2002) Environment section and the District of Squamish’s OCP (2007) Energy and Air Emissions section. Sources for both are provided, with contact information.
To establish the importance of energy to all aspects of the community’s social, economic and environmental well-being, the City of Surrey established energy efficiency as a high-level policy in its Official Community Plan (1996). In an effort to Build Complete Communities (Section 2.2C), Surrey endeavours to build energy efficient communities by supporting:

Energy conscious community planning and building design that makes communities more energy efficient, and supports all efforts to promote energy conservation and alternative energy sources which are environmentally friendly and sustainable. (Future Direction, C6)

Source
City of Surrey, Official Community Plan (1996). Available at www.surrey.ca. Contact: Mark Allison, Senior Planner, mballison@surrey.ca, 604.591.4594.

To establish the importance of demonstrating leadership in sustainable energy, the City of North Vancouver’s Official Community Plan (2002) emphasizes the importance of municipal action on energy management in the Environment section. Energy management goals and objectives are a key component of the City’s overall vision of becoming a more sustainable community. This includes the understanding that how energy is consumed has significant consequences for the environment and for quality of life. Although energy issues have traditionally been managed at the provincial level, the City of North Vancouver has an opportunity to participate at the local level to reduce the negative impacts of energy usage. (Section 8)

The City’s OCP goes further. Energy Planning Objectives (Section 8.5) encourage staff, council and the broad community:

• To promote energy efficient building design and practices for all development projects and City-owned buildings
• To implement Community Energy Systems as a means of providing heat energy for applications such as space heating and domestic hot water provided that it is demonstrated to be economically and technically feasible, and meets the City’s sustainability goals and objectives
• To collaborate with partners and agencies in the transportation and development fields to jointly achieve energy conservation
• To reduce greenhouse gas emissions by measures such as transportation alternatives to the automobile, including increased transit, and a network of walking and cycling paths
• To encourage the planning, design and construction of energy efficient neighbourhoods and buildings to minimize greenhouse gas emissions
• To minimize the use of non-renewable energy by increasing the use of clean and efficient renewable energy supply systems
• To encourage optimization of energy utilized during the full life cycle use of public and private assets, i.e., for the production, transportation and assembly of materials; for the lifetime operation and maintenance of the asset; and for the retirement, re-use and replacement of the asset

Source

To emphasize the community’s global citizenship (linking local efforts to regional, national and international energy and emissions policy), the District of Squamish’s Official Community Plan (August 2007, draft) includes a stand-alone section on partnerships in its Energy and Air Emissions section (Section 17). Actionable items include the following:

• 17.25. The District will form a committee with an energy management function to coordinate corporate and community-wide energy conservation, energy efficiency, renewable energy, and greenhouse gas reduction activities.
• 17.26. The District will seek partnerships with BC Hydro, Terasen Gas, independent power producers, the Resort Municipality of Whistler, the Squamish Lil’wat Regional District, provincial and federal agencies, and others to foster achieving the energy objectives of the community.
• 17.27. The District will continue to participate on the Sea to Sky Air Quality Coordinating Committee. It will also work with other municipalities in the Sea to Sky corridor, regional districts, utilities, and other partners on the committee to implement the Sea to Sky Air Quality Management Plan that they collaboratively developed.

Source
District of Squamish, Official Community Plan (August 2007, draft). Contact: Sabina FooFat, Planner, sfoofat@squamish.ca, 604.815.5017.

4 The District of Squamish OCP is undergoing review. The final version may differ slightly.
To articulate the relevance of energy management to land use planning and development controls, the District of Squamish includes a stand-alone section in its OCP on energy and air emissions (Section 17). Several specific objectives link energy management with land use, including:

- **Objective 1. Foster the conservation and efficient use of energy and other resources in buildings, vehicles, and infrastructure.**
- **Objective 5. Foster the planning, design, and development of neighbourhoods that support walking, cycling, and transit and other energy-efficient transportation modes.**

The City of Port Coquitlam also links the importance of energy considerations at the land use and site scale in its Official Community Plan (2005). Recognizing the City “has a role in promoting energy efficiency as a component of land use and development planning,” and that “the responsible location of land use, site planning, and building design can all contribute to a reduction in energy use” (Utilities and Services, Section 7.9), the OCP directs staff to “Consider energy efficiency principles and practices in land use planning, site planning, and building design” (Policy #9).

**Sources**
District of Squamish, Official Community Plan (August 2007, draft). **Contact:** Sabina FooFat, Planner, sfoofat@squamish.ca, 604.815.5017.

City of Port Coquitlam, Official Community Plan (2005). Available at www.city.port-coquitlam.bc.ca.
**Contact:** Kim Fowler, Director of Development Services, fowlerk@portcoquitlam.ca, 604.927.5432.

To direct future development to existing village/urban centres, the City of Abbotsford’s Official Community Plan encourages infill and mixed-use development. Part 3 of the OCP is organized by policy directions. Policy strategy 5, Strengthen our City Centre, includes the following objectives to guide energy-friendly growth:

- **5.2. Encourage innovative, sensitive infill and redevelopment**
- **5.3. Create a denser, mixed use city centre area**

Each objective features a discussion, a rationale, and specific policies and actions the City can take to achieve the objective.

**Source**
**Contact:** Peter Andzans, Community Sustainability Manager, PAndzans@abbotsford.ca, 604.864.5529.

To enable staff to explore energy options, both on the supply side (e.g., a district heating system) and the demand side (e.g., neighbourhood and site design), the City of North Vancouver includes a wide range of energy-related objectives in its Official Community Plan (Section 8.5, Energy Planning Objectives). See the City of North Vancouver example provided in B — in particular the objectives listed that encourage community energy systems, renewable energy supply systems, and energy efficient planning, design and construction.

Other good examples include the Energy and Air Emissions section of the District of Squamish’s Official Community Plan, which includes specific policies and supporting policies on community energy planning and district energy; the City of Surrey’s OCP Section C, Build Complete Communities; and the Corporation of Delta’s OCP Section 2.4, Energy and Water Consumption.

**Sources**
City of North Vancouver, Official Community Plan (2002). Available at www.cnv.org. **Contact:** Suzanne Smith, Planner, SSmith@cnv.org, 604.990.4240.

District of Squamish, Official Community Plan (August 2007, draft). **Contact:** Sabina FooFat, Planner, sfoofat@squamish.ca, 604.815.5017.

City of Surrey, Official Community Plan (1996). Available at www.surrey.ca. **Contact:** Mark Allison, Senior Planner, mballison@surrey.ca, 604.591.4594.

Corporation of Delta, Official Community Plan (1985). Available at www.deltaviews.com. **Contact:** Thomas Leathem, Deputy Director of Community Planning and Development, tleathem@corp.delta.bc.ca, 604.946.3381.

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5 All policies are rooted in and linked to the City’s 2003 Charter of Sustainability, which conveys the message that the City and its citizens are committed to supporting sustainable development principles and provides a framework for all City initiatives. Available at www.abbotsford.ca.
OCP objectives can set a foundation to advance energy efficient development, such as the newly constructed Quest University Canada campus building in Squamish.

To address the importance of energy efficient municipal buildings and equipment, the Corporation of Delta’s Official Community Plan includes a policy to “continue to incorporate energy efficient features into municipal facilities and use environmentally friendly building materials where feasible” (Section 2.4.35).

Though not an OCP objective, the City of Vancouver’s Energy Efficiency Purchasing Policy provides staff with clear guidance when purchasing energy-using equipment.

Sources
Corporation of Delta, Official Community Plan (1985). Available at www.deltaviews.com. Contact: Thomas Leatham, Deputy Director of Community Planning and Development, tleatham@corp.delta.bc.ca, 604.946.3381.

Contact: David Ramsile, Manager, Sustainable Development, david.ramsile@vancouver.ca, 604.873.7946.

To encourage full life cycle cost assessments for all municipal building energy-related decisions (e.g., heating, cooling or water energy systems), the City of North Vancouver included an objective in its Official Community Plan to:

encourage optimization of energy utilized during the full life-cycle use of public and private assets, i.e. for the production, transportation and assembly of materials, for the lifetime operation and maintenance of the asset, and for the retirement, re-use and replacement of the asset. (Section 8.5.7)

As another example, though not an OCP objective, the City of Richmond developed a Sustainable High Performance Building Policy that outlines similar requirements. This policy ensures that all new civic buildings and renovations will be evaluated based on considerations of life cycle costing and initial investment requirements. The policy applies to all civic buildings greater than 20,000 square feet and recommends that they pursue LEED® Gold certification (minimum LEED® Silver). Smaller civic buildings are encouraged to still incorporate the same standards, but not necessarily to LEED® certification.

Sources

Contact: Gavin Woo, Manager, Plan Review, GWoo@richmond.ca, 604.276.4113.
To encourage collaboration with other orders of government (e.g., regional, provincial, federal) and with utilities to address energy and emissions management, the Corporation of Delta’s Official Community Plan (1985) directs staff to “participate in senior government programs and initiatives that address climate change impacts and that help municipalities plan for local-scale impacts of climate change” (Schedule A, Section 2.4.29). Ideally, this direction would be expanded to include climate change mitigation and energy management.

The value of linking municipal policy with provincial, federal and even international policy cannot be overstated. Municipalities can benefit from policy directions established by higher orders of government that often have entire departments working on energy and emissions management.

The District of Squamish’s Official Community Plan (August 2007, draft) also directs staff, council and the broader community to collaborate with a range of external agencies. See under C, specifically objective 17.26.

Sources
Contact: Thomas Leathem, Deputy Director of Community Planning and Development, tleathem@corp.delta.bc.ca, 604.946.3381.
District of Squamish, Official Community Plan (August 2007, draft). Contact: Sabina FooFat, Planner, sfoofat@squamish.ca, 604.815.5017.

To establish and support an ongoing Energy Management Committee to advise council and the community on energy-related issues and work with other jurisdictions to explore options, the City of Abbotsford included a policy in its Official Community Plan intended to “provide advice to Council on environmental issues and opportunities” (Section 3, Objective 2.1). Although the Abbotsford example does not specify energy management, it could easily be included as part of a committee’s mandate.

Though not a specific OCP objective, the City of New Westminster has established an Energy Management Committee. The committee is composed of a range of representatives from different City departments, plus an external stakeholder from BC Hydro. The committee generally pursues the goal of reducing the costs and environmental impacts associated with energy and resource consumption.

Sources
City of Abbotsford, Official Community Plan (2005). Available at www.abbotsford.ca. Contact: Peter Andzans, Community Sustainability Manager, PAndzans@abbotsford.ca, 604.864.5529.
City of New Westminster, Energy Management Committee Terms of Reference. Contact: Rod Carle, General Manager, City of New Westminster Electric Utility Commission, rcarle@newwestcity.ca, 604.527.4569.
DEVELOPMENT COST CHARGES

Local governments Levy development cost charges (DCCs) on new development projects to cover the capital costs of infrastructure to service new development. Local governments acquire their legislative authority to charge DCCs from the Local Government Act, which allows local governments to impose DCCs to offset the capital burden imposed by new development for five types of infrastructure (see Section 933): sewer, water, storm drainage, road and parkland needed to accommodate growth. The maintenance and operating costs associated with infrastructure are not eligible. DCCs cannot reflect other sustainability considerations such as air quality, energy consumption, support for transit use, or maintenance of water quality, despite their overall benefit to society. There is no legislative authority to reduce DCCs for energy efficiency alone.

6.5 Policies at the Infrastructure & Land Use Level

As described in section 6.3, infrastructure and land use policies are at the top of the community energy management decision-making hierarchy. These policies typically set the context for and determine energy-related decisions at the building or site level and the energy-using equipment level.

For example, revising the development cost charges bylaw can encourage growth in designated areas, thereby increasing density, which in turn can help achieve the threshold density to make a district heating system economically viable, or result in the development of building types well suited to geo-exchange heating systems (e.g., multi-family buildings, mixed-use buildings).

Policies at the land use level typically take from years to decades for their potential to be fully realized and pertain to large spatial areas, if not the entire municipality. Policies at the land use level include development cost charges, zoning to encourage high density and mixed use, and service area bylaws.
Local governments are, however, empowered to vary DCCs by geographic area and building type so as to favour both Smart Growth and high-performance green building design. A report by West Coast Environmental Law (WCEL) entitled Do Development Cost Charges Encourage Smart Growth and High Performance Building Design? An Evaluation of Development Cost Charge Practices in British Columbia suggests that significant infrastructure cost savings associated with smart growth planning principles and high performance building design features are possible. Note that building design features would include those that reduce the servicing requirements for water, sewer and storm; energy is not applicable to DCCs. The WCEL report surveyed 15 municipalities’ DCC bylaws to assess whether any of them reflected differences in infrastructure costs related to location, land use, density and “green” design. The findings indicate:

Every municipality sets different DCCs for different land uses (e.g., commercial, residential, industrial) and almost every municipality sets different charges for single family and multifamily residential units. Some municipalities vary the multifamily DCC based on a project’s density. However, only a few municipalities vary the single family charge based on density and few vary commercial and industrial DCCs by density. Some municipalities set different charges for different geographic areas in the municipality, but many do not.

None of the municipalities examined currently takes high performance building design into account in setting DCC rates. (WCEL, 2003)

A DCC bylaw that doesn’t assess a levy based on density, geographic area and/or building design is a missed opportunity to encourage higher density development and better buildings. A finer grain DCC bylaw can feature lower levies for developments that impose a lower capital burden on the municipality; higher density developments and higher performance building design would be levied lower DCCs, thus providing a financial incentive to pursue these types of developments. As the WCEL report notes, Smart Growth development can result in significant infrastructure cost savings, thus it is suitable for development occurring in “Smart Growth” precincts to pay lower DCCs than developments occurring in areas with higher upfront (capital) servicing costs.

The District of Maple Ridge is in communication with the Province to revise and/or clarify the legislation to grant local governments the authority to waive or reduce DCCs for innovative development with a lower economic, social and ecological cost over the long term. The Union of BC Municipalities has since endorsed a resolution to this effect. The provincial government is currently reviewing how existing development finance tools including DCCs can be used to facilitate the development of sustainable infrastructure and buildings, and is looking at how enhanced development standards contribute to reducing infrastructure costs.

The DCC bylaw is an effective way to encourage greater density and, in the near future, may be a good way to encourage high-performance buildings with lower life cycle costs. The latter option will depend on the outcome of the District of Maple Ridge’s discussions with the Province.

Contact: Laura Benson, Policy Analyst, District of Maple Ridge, lbenson@mapleridge.ca, 604.466.4338.

The increased density and mixed use achieved through zoning is the foundation for schools of planning such as Smart Growth and New Urbanism. Benefits include increased accessibility to stores and services, minimum density and proximity for viable public transit, increased safety due to more “eyes on the street,” contained urban sprawl, more socially vibrant spaces, walkable communities, and increased opportunities to advance energy efficiency in buildings.

Promoting mixed-use, higher-density development through zoning can establish the necessary conditions for alternative energy supply technologies such as district energy systems and geo-exchange energy systems. Zoning determines land use and density, so while it can create the conditions for a desired land use mix and density, it cannot guarantee the developer will build to the allowable density. It is a good idea to engage a specialist to assess the likelihood of developers building to the allowable density and to determine the optimal land use for a technically, economically viable sustainable energy system. Examples of such studies include the following:

- **City of Vancouver, Southeast False Creek Phase 1 Energy Options Study (2002).** This series of documents was prepared by Compass Resource Management Ltd. (in association with Holland Barrs Planning Group, Busby & Associates Architects, and Pottinger Gaherty Environmental Consultants) for the City of Vancouver to provide strategic opportunities for energy efficiency and to utilize local energy supplies within the Southeast False Creek site. Available at www.city.vancouver.bc.ca/commsvcs/southeast/documents/index.htm#eos.

- **City of Vancouver, Southeast False Creek Neighbourhood Energy Utility.** These documents provide an overview of two energy supply options available for the Neighbourhood Energy Utility (NEU) sewer heat recovery and biomass; and current NEU activities, milestones and design implications. Available at www.city.vancouver.bc.ca/commsvcs/southeast/documents/index.htm#neu.
• **Salt Spring Island, Energy Consumption at “Build-out” Study (2007).** Islands Trust, Salt Spring Island contracted Sustainability Solutions Group and Holland Barrs Planning Group to assess the impacts of different build-out land use patterns on greenhouse gas emissions. This study was part of a broader review of Salt Spring Island’s Official Community Plan. The study includes a discussion of district energy systems. Available from the Salt Spring Office, Islands Trust, ssiinfo@islandstrust.bc.ca, 250.537.9144.

• **Greater Vancouver Regional District, Sustainable Energy Technology and Resource Assessment for Greater Vancouver (2005).** The GVRD commissioned Compass Resource Management Ltd. (in association with M.K. Jaccard & Associates) to conduct a technical and resource assessment of geo-exchange, sewer heat recovery and passive solar thermal technology. Although the report does not focus on zoning, the findings demonstrate the strong link between infrastructure, land use and building types, and economically viable sustainable energy technologies. Available at www.gvrd.bc.ca/buildsmart/pdfs/regionalassessmentofsustainablespaceheating.pdf.

Another useful resource for examples of zoning can be found in the Smart Growth on the Ground (SGOG) Concept Plans for Maple Ridge, Squamish and Greater Oliver. These Concept Plans are not zoning bylaws; however, they are useful examples that other municipalities can draw from when revising their zoning bylaws.

The Squamish and Maple Ridge plans include background information and targets for mixed use, higher density, core commercial to residential transition zones, and district energy systems. Relevant sections of each plan include the following:


District of Maple Ridge. A new high-density downtown zoning district was created. Details at www.sgog.bc.ca/content.asp?contentID=126.

7 Smart Growth on the Ground is an innovative program to change the way development is done in British Columbia, by creating real, built examples of Smart Growth. This program helps BC communities to prepare more sustainable neighbourhood plans — including land use, transportation, urban design, and building design plans. Extensive follow-up ensures that the plans become reality. SGOG is a partnership of the Design Centre for Sustainability at UBC, the Real Estate Institute of BC and Smart Growth BC. Together these three organizations work with a select group of BC communities.

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**SERVICE AREA BYLAW**

Under Section 8(2) of the Community Charter, a municipality may provide any service that the council considers necessary or desirable, and may do this directly or through another public authority or another person or organization. Local area services are a subset of the general service authority outlined in Section 8(2). The authority for establishing local area services resides under Section 210. Under these provisions, a service area bylaw can be used to establish service areas for particular types of energy services (e.g., a hydronic district heating system) and to require buildings within the service area to connect to the energy service.

**City of North Vancouver**

The City of North Vancouver established a bylaw to create a district heating service area for Lower Lonsdale, with a requirement that all new or retrofitted buildings over a certain size be connected to and use the system. A wholly owned subsidiary, Lonsdale Energy Corporation (LEC), was incorporated in 2003 to operate the system. The council acts as the tariff setter, regulating the rates charged by LEC. In February 2007, the City established a service area bylaw to introduce a second system, to be served by LEC, in the expanding Central Lonsdale neighbourhood.

**Source:** City of North Vancouver, Hydronic Heat Energy Service Bylaw 2004, no. 7575. To view the bylaw, visit www.cnv.org/c/apps/Bylaws/ and enter 7575 in the bylaw search engine. **Contact:** Suzanne Smith, Planner, SSmith@cnv.org, 604.990.4240.
6.6 Policies at the Building & Site Level

In the community energy management decision-making hierarchy presented in section 6.3, building and site-level policies (in the middle of the hierarchy) influence building and/or site-specific factors, which are lower down in the hierarchy. In terms of the timing, these policies will typically result in energy efficiency benefits at completion of construction (i.e., right away). Examples of policies at this level include sustainability checklists, development permit area guidelines and revitalization tax exemption bylaws.

**DEVELOPMENT PERMIT / REZONING SUSTAINABILITY CHECKLIST**

A sustainability checklist is a non-regulatory measure that can help encourage energy efficient or green buildings. 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). Completion of the checklist is mandatory, but pursuing specific actions is not mandatory. For this reason, the checklist is not regulatory in nature and is very developer-friendly. The checklist is part of the municipal development review process and helps council to ensure development proceeds in accordance with the community’s values.

Changes to municipal bylaws are not required to institute the use of such a checklist. A council resolution requiring completion of the checklist as part of a development permit application or an application for changes to the zoning bylaw (rezoning) is recommended. Ideally, there will be a linkage in the OCP identifying the checklist requirements and its objectives.

It is worth noting that, according to Section 919 of the Local Government Act, development permit areas (DPAs) can include intensive residential, commercial, industrial and multi-family residential development. They do not typically include single-family dwellings (unless considered intensive residential). The development permit/rezoning checklist may not be the best tool to guide single-family dwelling development. To overcome this challenge, the City of New Westminster developed an additional checklist for single-family dwellings (see page 37).
City of New Westminster

All applicants for rezoning and development permits in the City of New Westminster are required to complete a Smart Growth Development Checklist.

Key attributes
• Brings attention to Smart Growth principles when considering future development. Staff and council are more likely to look favourably upon rezoning applications that incorporate the areas of interest outlined in the checklist.
• New Westminster’s development permit area guidelines are very general, so the checklist helps staff get into more detail.
• The checklist is explicitly linked to broader sustainability objectives identified in the OCP.
• The checklist is not a pass/fail testing instrument.
• The checklist’s scope is broader than energy efficiency.
• Section 6 directly addresses energy efficiency and air quality.

Submission and review process
• The checklist is submitted as part of the pre-application process or as part of the proponent’s design review materials.
• Staff provide comments on the initial submission and give it back to the proponent. Following that, staff prepare a final checklist and submit it to the Advisory Planning Commission and design panels, and attached to staff’s report to council.


City of Port Coquitlam

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

Key attributes
• The checklist is explicitly linked to the broader sustainability objectives identified in the Official Community Plan and Corporate Strategic Plan.
• The checklist’s scope is broader than energy efficiency.
• Section 4c is specific to construction and design, including provisions for energy efficiency.
• The checklist employs a scorecard approach rather than a pass/fail approach.
• Criteria for different sections are weighted differently to emphasize their level of importance.
• Supplementary information is required, including the completion of the LEED-NC 1.0 Project Checklist, available at www.cagbc.org.

Submission and review process
• Proponents submit the checklist and supplementary information as part of the rezoning and/or development permit application.
• Staff review the checklist and discuss further with the proponent. Following that, staff prepare a final checklist and submit it to the Community and Economic Development Committee and council, as part of the application process.

Source: City of Port Coquitlam, Sustainability Checklist. See Appendix A of this manual. Also available at www.city.port-coquitlam.bc.ca.

Contact: Kim Fowler, Director of Development Services, fowlerk@portcoquitlam.ca, 604.927.5432.
City of New Westminster

Following creation of the development permit/rezoning checklist, staff at the City of New Westminster also developed a checklist for single-family dwelling development, the Smart Growth Development Checklist for Your Home.

There is less authority/discretion when it comes to single-family development, because this form of development does not occur within development permit areas and generally does not require a rezoning. The single-family dwelling checklist is introduced to applicants applying for a building permit. They are not required to complete it but are encouraged to complete it. The challenge with this approach is that by the time the proponent is applying for a building permit, their plans are nearly finalized. It is hard to introduce new concepts at this point.

Most people considering renovating, subdividing, building or developing single-family dwellings first inquire at the planning department about how to proceed. This first point of contact is an ideal opportunity to introduce the single-family dwelling checklist.

It is important to ensure there is strong interdepartmental communication with such a tool. Planning, engineering and building services should collaborate to get builders to consider the checklist. Other ways to introduce the checklist to builders include press releases, the City website and information packages available at the planning department counter.

Source: City of New Westminster, Smart Growth Development Checklist for Your Home.
Contact: Rod Carle, General Manager, City of New Westminster Electric Utility Commission, rcarle@newwestcity.ca, 604.527.4569. Alternatively: City of New Westminster Planning Department, 604.527.4532.

Other Examples of Sustainability Checklists

City of Kelowna. Contact: Don Degen, Utilities Manager, ddegen@kelowna.ca, 250.469.8913.
City of North Vancouver. Contact: Gloria Venczel, Planner, gvenczel@cnv.org, 604.982.3904.
District of Vanderhoof. Contact: Kerry Pateman, Planning Consultant, kpateman@shaw.ca, 250.564.7136.
Sections 919.1 and 920 of the Local Government Act authorize the establishment of development permit areas (DPAs) and the use of development permits. If an Official Community Plan designates a development permit area, an owner must obtain a development permit before the land is subdivided or building commences.

Development permit areas may be designated for various purposes listed in Section 919.1, including the establishment of objectives for the form and character of intensive residential development. If an area is designated in this way, the development permit may include requirements about landscaping and the siting, form and exterior design and finish of buildings.

Following are two examples of DPA guidelines being used to advance energy efficiency. Based on these examples, it appears DPA guidelines can be used to advance access to sunlight for solar energy and natural ventilation. However, it is very unlikely DPA guidelines can be used to require efficiency measures unrelated to form and character (e.g., additional insulation, ground source heat pump).

City of Richmond

The City of Richmond’s development permit guidelines include provisions for solar access and operable windows, suggesting the intent was to increase passive solar gains and natural ventilation. The multi-family building guidelines (Section 9.3.2) encourage:

- Sunlight access — minimum 75 percent of dwellings and open spaces receive direct sunlight every day of the year
- Minimum north-south spacing
- Orient windows to the south in order to maximize solar gain
- Operable windows

Contact: Gavin Woo, Manager, Plan Review, GWoo@richmond.ca, 604.276.4113.

District of Saanich

Saanich recently procured the services of Holland Barrs Planning Group to revise its DPA guidelines to include energy efficiency provisions, among other things. The new guidelines are still in draft format but include three pages of guidelines and schematics covering energy efficiency, shading, natural ventilation and building orientation.

Contact: Russ Fuoco, Director of Planning, fuocor@saanich.ca, 250.475.5472.

An excellent additional resource for identifying passive solar and natural ventilation guidelines is the Canada Mortgage and Housing Corporation publication Tap the Sun: Passive Solar Techniques and Home Designs. Available at www.cmhc-schl.gc.ca.
Local governments in British Columbia are empowered to regulate the use of land under Section 903 of the Local Government Act, which outlines the scope of zoning power. Establishing comprehensive development (CD) zones allows for development of a site with a range of land uses and approaches to development that do not correspond with existing zoning schedules. Comprehensive development zones give developers and municipal staff the latitude to tailor the development in ways existing zoning does not permit.

**City of Langford**

The City of Langford’s Westhills development is a mixed-use neighbourhood with approximately 6,000 residential units and commercial and civic buildings. All commercial and multi-family residential buildings are required to be LEED® certified. All residential buildings that do not fall within LEED® certification will be required to be built to a Built Green™ standard. Westhills is officially registered as a LEED-ND (new development) pilot project under the US Green Building Council pilot program. The USGBC has a large number of pilot projects, a small number of which are in Canada.

**Source:** City of Langford, Official Community Plan. Available at www.cityoflangford.ca. **Contact:** Matthew Baldwin, City Planner, mbaldwin@cityoflangford.ca, 250.474.6919.

**Building Energy Performance Standards Via Rezoning**

Often a developer will want to build a structure that is of a greater density than the current zoning allows. In these situations, the developer will approach the municipality with an application to rezone their property. Council is not required to grant a zoning bylaw amendment, yet is empowered to permit rezoning and exercise its discretion for what land use and density are permitted on the site. Sometimes municipalities agree to accept additional amenities or community benefits (e.g., energy efficient building features) in connection with rezoning.

Local government staff are permitted to require the rezoning applicant to prepare a development plan. Often the staff will suggest that the voluntary grant of a covenant from the developer, in order to secure community benefits or amenities, will assist in obtaining staff’s favourable recommendation to council to grant a zoning bylaw amendment. However, the bargaining conducted by staff cannot contractually bind council to provide the rezoning. Council must maintain its right to exercise its discretion (i.e., have and make a choice) on whether or not a zoning bylaw amendment will be allowed.

**Bowen Island Municipality**

The Bowen Island Municipality developed a council policy whereby rezoning applicants are expected to achieve Built Green™ Gold and an EnerGuide for New Houses rating of 80.

**Source:** Bowen Island Municipality, Green Building Standards for Residential Re-zoning, Policy #01-07 (2007). Available at www.bimbc.ca/policies. **Contact:** Jason Smith, Planner, jsmith@bimbc.ca, 604.947.6980.
Offering developers an incentive on building permit fees and “top of the pile” permit processing service can be a practicable way to encourage energy efficient buildings.

**District of Saanich**

The District of Saanich issues a grant to residential building permit applicants if the building reaches a minimum “green” performance standard (a combination of Built Green™ and EnerGuide).

The municipality gives priority processing and offers a grant based on building permit fees of up to 30 percent to residential applications achieving energy efficiency and green building standards (Built Green™ standards). Saanich also pays for a contractor to serve as an energy adviser, directing builders to available technologies and incentives and assisting them with incentive applications.

**Source:** District of Saanich, Green Building Rebate Program. Information available at www.gov.saanich.bc.ca/business/development/. **Contact:** Russ Fuoco, Director of Planning, fuocor@saanich.ca, 250.475.5472.
A revitalization tax exemption (RTE) bylaw provides a financial incentive for developers to build in a specified area of the municipality and/or to a specified building standard. Environmental revitalization, including energy efficiency, is listed by the Province as being within the intent of the legislation.

Here is an excerpt from “Revitalization Tax Exemptions: A Primer on the Provisions in the Community Charter” (Ministry of Community Services, 2007, page 2):

Section 226 of the Community Charter provides authority to exempt property from municipal property value taxes. To use this authority, a Council must establish a revitalization program (with defined reasons for and objectives of the program), enter into agreements with property owners, and then exempt their property from taxation once all specified conditions of the program and the agreement have been met. Exemptions may apply to the value of land or improvements, or both. Councils are free to specify, within their revitalization programs, the amounts and extent of tax exemptions available.

Revitalization tax exemptions are limited to municipal property value taxes (Section 197(1)(a) of the Community Charter only) and do not extend to school and other property taxes, such as parcel taxes. An exemption may be granted for up to 10 years.

The authority to provide a revitalization tax exemption is not subject to section 25 of the Community Charter (prohibition against assistance to business). Section 396E of the Vancouver Charter also provides the City of Vancouver with authority to provide revitalization tax exemptions.

**District of Maple Ridge**

The District of Maple Ridge offers a property tax exemption for high-rise residential development that occurs within the pre-designated revitalization area (created through bylaw). The provincial legislation was recently changed so designating a revitalization area by bylaw is no longer required. The revitalization tax exemption reduces property taxes (municipal taxes only) in the year following the tax certificate issuance. The District also monitors for compliance and cancels the certificate if necessary.

As shown in the table above right, 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.

**Source:** District of Maple Ridge, Revitalization Tax Exemption Bylaw (2006). Available at www.mapleridge.ca. **Contact:** Laura Benson, Policy Analyst, lbenson@mapleridge.ca, 604.466.4338.

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8 Available at www.cserv.gov.bc.ca/lgd/gov_structure/library/community_charter_revital_tax_exemptions.pdf.
Density bonusing is a process whereby a local government permits additional density beyond the applicable zoning for the area in exchange for the provision of an amenity or affordable housing. Planning departments can promote energy efficiency by including high-performance “green” buildings as an amenity (linked to environmental/health benefits) and granting additional density for green building measures.

Section 904 of the Local Government Act allows the provision of additional density where specified amenities are provided. This must be set out in a zoning bylaw. The bylaw must describe the conditions that, if met, will entitle the developer to additional density (e.g., energy efficiency features). When developing a density bonus regime, due diligence is necessary to consider the impact greater density may have on services and the neighbourhood, and at what density developers will be enticed to provide an amenity in exchange for more floor space.

Another mechanism to secure amenities is Phased Development Agreements, brought into force by regulation in June 2007 as Section 905.1 in the Local Government Act. The concept of entering into agreements with developers to provide community “amenities” is made explicitly lawful in this legislation. Advisory materials are being prepared and will be posted on the website of the Ministry of Community Services, www.gov.bc.ca/cserv/. Note that the provisions complement those in Section 904; they do not replace them.
SFU UniverCity Community Trust

SFU Community Trust (SFU CT) is responsible for managing the development of the UniverCity Community at Simon Fraser University (www.univercity.ca), a unique development in the City of Burnaby. SFU CT does not hold regulatory power, but works in collaboration with the City of Burnaby to develop policies and guidelines that meet the objectives of SFU CT.

SFU CT has recently developed a green building bonus, in conjunction with the City of Burnaby, for features that exceed the minimum green building requirements. The green building requirements set out mandatory sustainable building elements that must be met as a condition of City of Burnaby zoning, but as administered and verified by SFU CT.

The green building bonus allows up to an additional 10% density for green building features in excess of the requirements, as administered by SFU CT and approved by the City of Burnaby. The bonus is granted for:

- Enhanced stormwater management – 5% floor area ratio (FAR) Bonus for enhanced stormwater management systems
- Enhanced energy efficiency – 5% FAR bonus for buildings that are the equivalent to 23% better than ASHRAE 90.1 (for buildings with a common corridor, typically Part 3 buildings) and meet or exceed EnerGuide 80 and/or R-2000 (for buildings without a common corridor, typically Part 9 buildings)
- Alternative energy systems – 10% FAR bonus for installing a renewable or ultra-high-efficiency energy system to meet a minimum of 50% of building energy loads, including space heating and domestic hot water

The green building bonus is currently under review for public hearing and approval by the City of Burnaby in November 2007. Once it is approved and enacted, in order to receive the bonus density, the applicant will be required to have verification by an approved green building consultant or SFU CT-approved alternate with LEED® or other green building experience. The consultant will submit verification through a clearly defined three-phase verification procedure (preliminary permit approval, building permit and occupancy permit).

Other Examples of Density Bonusing

There are several examples of local government using the density bonusing tool for such things as affordable housing, employee suites, child care, parking, parks, and cycle paths. Examples are available at West Coast Environmental Law’s Smart Growth Bylaws Guide – Table of Bylaws, available at www.wcel.org/issues/urban/sbg/bylaws/. It may be possible to use existing examples as a foundation for a green building density bonus regime.

Building-related bylaws can have unintended disincentives that inhibit energy efficiency and present real or perceived barriers to the deployment of sustainable energy technologies such as geo-exchange. In some cases, the real or perceived barrier to energy efficiency is due to justifiable reasons, such as ensuring the mechanical equipment provides adequate space heating. In other cases there may be ways to ensure due diligence while removing any potentially inhibiting barriers.

City of Kelowna

An example of a possible barrier to greater deployment of geo-exchange energy systems is in the City of Kelowna’s Geo-Thermal Heating Systems Bulletin. Geo-exchange energy systems — sometimes referred to as ground source heat pump systems — are an efficient way of providing buildings with space heating and cooling, and hot water. The City of Kelowna’s Geo-Thermal Heating Systems Bulletin states that all systems “must either be designed by a Professional Engineer or be supplied with a backup heating system capable of supplying the entire heating needs.”

Some geo-exchange installers claimed the engineering design requirement or the 100 percent auxiliary backup system makes the geo-exchange energy systems cost-prohibitive. They claim the additional upfront costs increase the life cycle cost of the system to a point where the system is no longer competitive with a conventional system. Several engineers and energy analysts felt the engineering design or 100 percent auxiliary heating requirement posed a legitimate barrier to the deployment of more geo-exchange systems in Kelowna.

Plumbing and gas inspection services department staff may be justified in requiring some assurance that geo-exchange systems are capable of providing the heating comfort requirements established in the BC Building Code. Municipal-level staff are unlikely to have expertise in geo-exchange systems, so may lack the confidence that the system can provide adequate heat. Yet when issuing a building permit under designated authority from the Province, municipal staff must be sure the system provides the necessary heat or could be held liable for issuing a permit for a substandard building.

As a partial solution, the City of Kelowna approved the use of an interlock system from the heat pump to a natural gas fireplace, as an auxiliary heat source, for use when the outdoor temperature falls below –17°C Celsius during heating periods. This partially addresses the auxiliary heat source requirement barrier.

Contact: John Hailstones, Plumbing and Gas Supervisor, jhailstones@kelowna.ca, 250.469.8592.
Another potential solution to this possible barrier is offered by the Canadian GeoExchange Coalition (CGC). The CGC’s Global Quality Geoexchange™ Program® now offers the first comprehensive geo-exchange quality assurance mechanism in Canada. Completing the CGC training forms part of the first industry accreditation and certification mechanism. The accreditation mechanism requires that participants agree to the CGC Code of Conduct, carry professional liability and workmanship insurance, have completed a certain number of successful supervised installations, and be generally in good standing in the industry.

If the CGC program is to the satisfaction of municipal staff and solicitors, municipalities could consider reviewing their applicable bylaws, policies or bulletins to exempt accredited designers/installers from building and/or heating system requirements that might be barriers to geo-exchange installations.

More information on the Canadian GeoExchange Coalition’s training and accreditation program is available at www.geo-exchange.ca.

**LOCAL IMPROVEMENT CHARGES**

A local improvement charge (LIC) is a financing mechanism that allows municipalities to cover the capital costs of specific improvements to a site or neighbourhood, then recover those costs through the property taxes of the owner(s) that benefit from the improvement. The LIC shows up as an additional line item on the property owner’s municipal taxes.

The Pembina Institute conducted a national scoping exercise of LICs in its report *Using Local Improvement Charges to Finance Energy Efficiency Improvements: Applicability Across Canada* (2005). The report features a section on legislative authority for LICs, including provisions under the Community Charter and the Vancouver Charter (see Appendix 2 of the report, Provincial Regulations Governing LICs, page 38).

The report notes that the main advantage of the LIC is that it associates the repayment of the cost of efficiency improvements with the building property rather than with the current building owner. Owners who are unsure whether they will remain at the location long enough to enjoy the operational cost savings associated with the improvement may be hesitant to lay out the upfront costs associated with most energy efficiency upgrades.

With the exception of the Yukon, LICs have not been used to finance energy improvements on private property anywhere in Canada to date. However, a 2007 legal opinion obtained by the District of Central Saanich has confirmed that BC municipalities do have the legislative authority to use LICs for such purposes.


**Contact:** Matt Horne, Senior Energy Analyst, Pembina Institute, matth@pembina.org, 604.874.8558.
6.7 Policies at the Energy-Using Equipment Level

Policy tools at this lowest level of the community energy management decision-making hierarchy are limited to energy-using equipment (e.g., furnaces). Generally speaking, local governments have limited control over such things as appliances and lighting. However, they do have some control over the sizing of heating equipment through the heating and building permit process.

**HEAT LOSS CALCULATION FOR BUILDING/HEATING PERMIT**

Local governments deliver and enforce the BC Building Code. As per the 2006 BC Building Code, Section 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.

Municipalities can leverage the heat loss calculation policy tool to inform building owners about other areas where energy efficiency can be improved. Building permit departments can recommend that permit applicants acquire their heat loss calculations through an EnerGuide audit. In addition to the heat loss calculation, EnerGuide audits provide energy efficiency recommendations in a number of areas. Builders may pursue some of the other recommendations in the EnerGuide audits, resulting in unintended energy-related benefits.

**City of Burnaby**

Prior to the installation of any heating system in single- or two-family dwellings or townhouses or in multi-family units that have individual, self-contained heating systems for each unit, the City of Burnaby requires contractors to apply for and obtain heating system permits from the City’s building department. A heating system permit is required 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.

**Source:** City of Burnaby, Heating System Permits. Available at www.city.burnaby.bc.ca.
**Contact:** City of Burnaby Building Department, 604.294.7130.
Energy efficiency is becoming more critical given the global challenges of climate change and Peak Oil. Improving energy efficiency will not only reduce the environmental impacts of energy consumption, but will also save users money, for energy prices are only going to rise over the coming years.

- Residential Green Building Policy
- Civic Facilities Green Building Policy
- Green Buildings Strategy for Surplus Lands

- Engage council and key actors from the beginning of the policy development process.
- Focus on areas where you can actually influence change and use this as a device to educate the wider community.
- Keep the policy simple and focused.

- Start with changing the operations of the municipality itself.
- Establish a baseline of energy use. This is an extremely useful tool to help focus on the areas that need the most attention.
- Tap into the network of communities that are taking action on energy management.

www.bimbc.ca
7 • Conclusions

This manual has provided an overview of the policy context and the tools available to local governments to pursue energy efficiency initiatives. Commercial and residential buildings, controlled by local governments, account for 27 percent of BC’s energy consumption. To date, several local governments have focused on retrofitting civic buildings and incorporating energy efficiency into their new civic building stock. To accelerate energy conservation at the broader community level, local governments have also begun to initiate policy-driven changes.

Current building standards and rating systems provide a foundation for local governments to build upon. Basic energy efficiency standards exist for commercial, institutional and residential buildings as well as equipment. Official standards can be implemented and/or augmented through incorporating energy efficiency goals into Official Community Plans. Integrating energy efficiency into an OCP sets the foundation for developing more specific energy efficiency policies.

Local governments can utilize policy tools at three decision-making levels: infrastructure and land use, building and site, and energy-using equipment. Policies at the building and site level have to date been the most widely used by local governments to promote energy efficient buildings.

Although many tools are available to local governments to promote energy efficient buildings, this manual has outlined the federal and provincial policies that dictate building standards. Energy efficiency initiatives at the local level could be significantly strengthened with federal and provincial legislative and policy changes that would mandate and/or promote higher energy efficient building standards.
The City of Port Coquitlam is committed to fi
scally, socially and environmentally responsible land use development. Sustainable development integrates the three systems that support us – the economy, the environment and our society. Each of these systems must be functioning and healthy for us to survive and enjoy a high quality of life. To be sustainable, we must understand how these systems interact, and make sure our activities do not compromise the ability of any of the systems to function currently and in the future.

New development is essential to achieve a complete community in which to live, work and play. The location, composition, density, and design of new development projects can have an immense, cumulative impact on our community’s ability to: sustain a healthy economy and reasonable cost of living; to provide effective and accessible public services; to secure adequate choice and opportunity for present and future generations of residents; to protect our environment; and to ensure we all continue to enjoy a high quality of life.

Developers and their consultants are important partners in maintaining and improving our community’s high quality of life. By providing sustainability criteria at the earliest development stage, the City enables developers and their consultants to create the most sustainable project possible. The Sustainability Checklist provides a comprehensive assessment of a development project’s contribution to sustainability by balanced scoring of environmental, economic and social criteria. The balanced scoring of 1/3 environmental, 1/3 economic and 1/3 social is called triple bottom line assessment.

Our Vision
Port Coquitlam will aspire to be a complete community, unique because of its small town atmosphere, its strong sense of pride and where:

• Citizens have a collective sense of belonging, and contribute to the quality of life in the community.
• The community celebrates a vibrant culture and heritage.
• The environment is nurtured for present and future generations.
• A dynamic economy contributes to prosperity and the opportunity to work close to home.
• Planned development strengthens the character of the community, helping to create safe and affordable neighbourhoods.

— Port Coquitlam Official Community Plan (OCP), 2005

Using Triple Bottom Line Assessment to Achieve Sustainability Goals

The City of Port Coquitlam is committed to fiscally, socially and environmentally responsible land use development. Sustainable development integrates the three systems that support us – the economy, the environment and our society. Each of these systems must be functioning and healthy for us to survive and enjoy a high quality of life. To be sustainable, we must understand how these systems interact, and make sure our activities do not compromise the ability of any of the systems to function currently and in the future.

Sustainability: To improve the social, environmental and economic well being of the community through good planning and land use management (OCP, 2005)
Please note, in total, the checklist describes an ideal – it is highly unlikely that any one project will earn maximum points in all sections, and no pass/fail standard has been set. Different types of development will result in a range of scores, and some sections may not be applicable to all development, which will be noted in the assessment. The checklist assessment will indicate how well a proposed application performs relative to the sustainability and complete community goals contained in our OCP and Corporate Strategic Plan, and help identify any areas where improvement is desirable and possible. It will inform decisions in the development approval process as to how well a proposed development achieves community sustainability.

**INSTRUCTIONS**

All Rezoning and Development Permit applicants are required to complete the Sustainability Checklist, as follows:

1. **Self-Scoring** – Applicants are to review and complete the checklist, as an initial assessment. The criteria are weighted differently so the maximum score for each criterion reflects its importance to sustainability goals. To calculate the score, multiply the points for a given answer by the criteria’s weight and enter it into the designated TBL column. The first page divides the weighting score into 50% for the economic and social columns. The second page directs the scores to be placed in the unshaded column.

2. **Supplementary Information** – Statistical data indicated by an asterisk (*) is to be provided (e.g. the number of permanent employees, floor area ratio, property tax base increase) as well as a completed copy of the LEED Canada-NC 1.0 Project Checklist or best practice checklist for each application. Consultation with City staff may be of assistance in estimating this data. If needed, provide any additional description of how the proposed development incorporates the sustainability criteria.

3. **Submit Application** – Submit the completed checklist, data and supplementary information as part of the rezoning or development permit application.

4. **Final Assessment** – City staff will review the checklist and discuss with the applicant. Following the consultation with the applicant, a final checklist will be completed by staff for review by the Community and Economic Development Committee and Council, as part of the application process.

**OTHER RESOURCE MATERIALS**

- Official Community Plan – [www.portcoquitlam.ca](http://www.portcoquitlam.ca)
- 2002 Strategic Plan – [www.portcoquitlam.ca](http://www.portcoquitlam.ca)
- Zoning Bylaw – available at City Hall
- Downtown Plan – available at City Hall
- Canada Green Building Council website – [www.cagbc.org](http://www.cagbc.org)
- SmartGrowthBC website – [www.smartgrowth.bc.ca](http://www.smartgrowth.bc.ca)

**FOR MORE INFORMATION, CONTACT:**
Planning Division
2nd Floor, City Hall, 2580 Shaughnessy Street
Port Coquitlam, BC V3C 2A8
Tel 604.927.5410
Fax 604.927.5331
Email planning@portcoquitlam.ca
[www.portcoquitlam.ca](http://www.portcoquitlam.ca)
1. Land Use
   • Mix of uses provided or uses consistent with OCP
   • Adds to the diversity of uses within an existing neighbourhood, such as employment, housing, retail, civic, educational, cultural, recreational

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2. Housing
   • Offers or adds a mix of housing types, sizes and tenure, including special needs
   • Provides units with a wide-range of pricing options that will be sold or leased
   • Provides subsidized or rental housing

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3. Community character and design
   a) Design
      • Building design follows required architectural style and demonstrates innovation
      • Building orientation towards open space, views and/or daylight
      • Treatment of façade breaks down massing and articulates depth, verticality & street edge
      • Scale and massing of buildings relate to neighbourhood structures
      • Provides crime prevention through environmental design
      • Incorporates enhanced durability/longevity of construction materials.

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   b) Public Space
      • Creates or enhances community spaces, such as plazas, squares, parks & streets
      • Strong connections to adjacent natural features, parks and open space
      • Builds or improves pedestrian amenities, such as sidewalks, transit shelters, bike racks and connections to civic, cultural, school and retail/service uses

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   c) Density & Infill
      • Maximizes FAR or dwelling unit/acre density
      • Results in infill/redevelopment and enhanced community fabric

<table>
<thead>
<tr>
<th>Points</th>
<th>Wt</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>None - 0</td>
<td>1 /5</td>
<td>(50%)</td>
</tr>
<tr>
<td>Poor - 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good - 2 to 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent - 4 to 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   d) Transportation
      • Accessible by multiple modes of transport, emphasizing public transit including future planned
      • Parking does not visually dominate the street view & allows easy, safe pedestrian building access
      • Interconnected road system with direct street connections, short block lengths, no cul-de-sacs
      • Provides traffic speed & demand management

<table>
<thead>
<tr>
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<td></td>
</tr>
<tr>
<td>Excellent - 4 to 5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Environmental Protection & Enhancement  

<table>
<thead>
<tr>
<th>Points</th>
<th>Wt</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soc</td>
<td>Env</td>
<td>Eco</td>
</tr>
<tr>
<td>4. Environmental Protection &amp; Enhancement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Lands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Does not intrude on ALR or designated open lands</td>
<td>None – 0</td>
<td>2 /10</td>
</tr>
<tr>
<td>• Protects riparian areas and other designated environmentally sensitive areas</td>
<td>Poor – 1</td>
<td></td>
</tr>
<tr>
<td>• Provides for native species habitat restoration/improvement</td>
<td>Good – 2 to 3</td>
<td></td>
</tr>
<tr>
<td>• Redevelops environmentally contaminated site</td>
<td>Excellent – 4 to 5</td>
<td></td>
</tr>
<tr>
<td>b) Servicing</td>
<td>None – 0</td>
<td>1 /5</td>
</tr>
<tr>
<td>• Does not require extension of existing municipal infrastructure (e.g. roads, water and sewer)</td>
<td>Poor – 1</td>
<td></td>
</tr>
<tr>
<td>• Located in existing commercial and transportation nodes</td>
<td>Good – 2 to 3</td>
<td></td>
</tr>
<tr>
<td>c) Construction/Design</td>
<td>None – 0</td>
<td>4 /20</td>
</tr>
<tr>
<td>• Provides LEED certification (certified, silver, gold, platinum) or accepted green building best practices (e.g. Built Green BC, Green Globes)</td>
<td>Certified – 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Silver – 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gold – 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Platinum - 5</td>
<td></td>
</tr>
<tr>
<td>5. Social Equity</td>
<td>None – 0</td>
<td>2 /10</td>
</tr>
<tr>
<td>• Contains elements of community pride and local character, such as public art</td>
<td>Poor – 1</td>
<td></td>
</tr>
<tr>
<td>• Provides affordable space for needed community services</td>
<td>Good – 2 to 3</td>
<td></td>
</tr>
<tr>
<td>• Conducts public consultation, including documenting concerns &amp; providing project visuals</td>
<td>Excellent – 4 to 5</td>
<td></td>
</tr>
<tr>
<td>6. Economic Development</td>
<td>None – 0</td>
<td>1 /5</td>
</tr>
<tr>
<td>a) Employment</td>
<td>None – 0</td>
<td>1 /5</td>
</tr>
<tr>
<td>• Provides permanent employment opportunities</td>
<td>Poor – 1</td>
<td></td>
</tr>
<tr>
<td>• Increases community opportunities for training, education, entertainment or recreation</td>
<td>Good – 2 to 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Excellent – 4 to 5</td>
<td></td>
</tr>
<tr>
<td>b) Diversification and Enhancement</td>
<td>None – 0</td>
<td>1 /5</td>
</tr>
<tr>
<td>• Net increase to property tax base</td>
<td>Poor – 1</td>
<td></td>
</tr>
<tr>
<td>• Promotes diversification of the local economy via business type and size</td>
<td>Good – 2 to 3</td>
<td></td>
</tr>
<tr>
<td>• Improves opportunities for new and existing businesses, including eco-industrial and value-added</td>
<td>Excellent – 4 to 5</td>
<td></td>
</tr>
<tr>
<td>• Developer demonstrates experience with similar projects</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

52 67

TRIPLE BOTTOM LINE SUMMARY

<table>
<thead>
<tr>
<th>Social/Environmental/Economic</th>
<th>Application Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>( %) ( %) ( %)</td>
<td>/105</td>
</tr>
</tbody>
</table>

1 Per the instructions, please provide statistical data for these indicators, such as floor area ratio, estimated number of employees, number of housing types, sizes and tenures.

2 Subsidized Housing encompasses all types of housing for which some type of subsidy or rental assistance is provided, including public, non-profit and co-operative housing, as well as rent supplements for people living in private market housing. It also includes emergency housing and short-term shelters. Enhanced community fabric includes multiculturalism, mobility accessibility, integration with neighbourhoods and crime prevention through environmental design.

3 Please provide a copy of the green building checklist chosen. For example: LEED Canada-NC 1.0 Project Checklist can be obtained at: http://www.cagbc.org/uploads/LEED%20Canada-NC%20Project%20Checklist.xls

Green Building Bonus

This section identifies green building elements that exceed the minimum requirements, but are strongly encouraged in order to fulfill environmental and sustainable design goals of UniverCity.

Where these elements are incorporated in building design, construction, and commissioning, the floor area ratio may increase to a maximum of 10% of the permitted FAR of the site. As this is an “optional” green building component not required as a component of the zoning bylaw, a Letter of Credit (LOC) will be taken by SFUCT to ensure compliance, for release upon issuance of Occupancy Permit. The LOC will be calculated to equal 50% of the added value of the 10% density increase based on the land value of this density as determined by the price per square foot agreed upon in the Lease Agreement between SFUCT and the Applicant.

Verification:

In order to receive bonus density, the applicant shall have an approved green building consultant or SFU CT approved alternate with LEED or other green building experience, submit verification to SFU CT of design prior to PPA Submission to receive approval of bonus density. This will be again verified by SFU CT at issuance of Occupancy Permit to ensure compliance and release of Letter of Credit. The specific verification is identified within each bonus. SFU CT provides approval to the City of Burnaby Planning and Building Department through formal letter of compliance with supporting proof.

Three (3) elements are available for increased density:

7.1. Enhanced Stormwater Management – 5% FAR Bonus.

Design and install an enhanced Stormwater Management system that utilises multiple measures of stormwater control systems (green roofs, interflow zones, detention trenches, cisterns, etc) in order to exceed the minimum UniverCity stormwater requirements for both storage and flow rates by a minimum of 10% as shown through water balance model calculations. If green roofs are chosen as the sole technology, an increase in density of 1.0sq.ft. will be granted for every 3sq.ft. of green roof installed up to a maximum density increase of no greater than 5%. Preference will be given to systems that demonstrate stormwater management by managing it in visually attractive systems.

Verification:

• PPA: Provision by proponent of Water Balance Model and calculations showing enhanced reduction in storage and flow.
• Occupancy Permit: Provision by proponent of construction drawings and documentation showing installation of approved system.
7.2. Enhanced energy efficiency – 5% FAR Bonus.

Buildings with a common corridor (typically Part 3 Buildings) shall perform no less than 15% better than the minimum building energy requirement in Section 1.3.1, or a total of 35% better than MNECB for the building type (or a minimum of 23% better than ASHRAE 90.1, 2001), including the provision of modeling results for verification.

For buildings without a common corridor (typically Part 9 Buildings), the base requirement meet or exceed EnerGuide 80 and/or R2000, including the provision of modeling results for verification. Ensure that when low temperature hydronic district heating systems are installed, that they shall work within operating temperatures specified by SFUCT, including rough-in and/or stub-outs/connections for future integration.

- PPA: Provision by proponent of building energy modeling showing reduction.
- Occupancy Permit: Provision by proponent of as-built energy model simulation/test.

7.3. Alternative energy systems – 10% FAR Bonus.

Design and install a renewable or ultra-high efficiency energy system to meet a minimum of 50% of building energy loads, including space heating and domestic hot water. All additional building energy loads shall be met through Ultra High Efficiency boilers. Specifications of the system shall be provided by the consulting mechanical engineer.

- PPA: Provision by proponent of building energy modeling showing provision of 50% of building load by proposed system, and associated PPA level working drawings.
- Occupancy Permit: Provision by proponent of as-built energy model showing capacity of installed alternative system and provision of final construction drawings and documentation.