



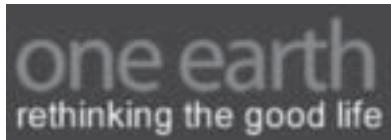
eco-strata guide

a green guide for multi-family dwellings in
metro vancouver

investing in the future, using fewer resources,
living better, saving money



This guide was produced by the One Earth Initiative Society in partnership with the Condominium Home Owners Association.



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Welcome

We want to hear from you

This guide is part of a dialogue – join us at: www.eco-strata.com

- Share your stories, lessons learned and tips on greening your building.
- Is this guide useful?
- What is your favourite part?
- What have we missed?

Definitions of sustainability

“Meeting the needs of the present without compromising the ability of future generations to meet their own needs.” – United Nations Brundtland Commission

“Improving the quality of human life whilst living within the carrying capacity of the Earth’s ecosystems.” – World Wildlife Fund

This guide holds dozens of practical tips on how you can green your building. It has been written for...

- Multi-family building owners or renters
- Strata council members
- Property management companies
- Building or real estate experts, and
- Interested people who are keen to learn about greening buildings

Are you on your strata council or are you a resident of your building and wondering what you can do? Are you interested in the financial savings that come from greening your building? Are you literally getting sick and tired from the toxic chemicals in your paint, carpets and walls? Maybe you want to do your part in tackling climate change and wasteful consumption.

This guide’s goal is to help you create an eco-strategy and take action to reduce your building’s impact on the Earth. Although this document was prepared with reference to the Metro Vancouver region, it applies widely if not everywhere.

This guide is focused on existing buildings – specifically multi-family dwellings – also known as apartments, townhouses, condos, or ‘vertical villages.’ It contains a host of eco-friendly and healthy options and alternatives that can, for the most part, be implemented without too many hassles and difficulty.

Why an Eco-Strata Guide?

Buildings are a big part of the solution to challenges such as rising energy and food prices, climate change, biodiversity loss, and poverty. We know we can’t use energy and materials and produce waste in the same way and at the same rate without destroying our long-term future. Sustainability or ‘sustainable development’ is at the heart of this Eco-Strata guide. The decisions we make have local and global consequences, long term impacts, and are all interconnected to social, economic and ecological systems.

The good news story

Much can be done at the household level and in a building to minimize material and energy use. This ranges from easy projects, such as using low-energy lighting fixtures and insulating hot-water pipes, to larger investments such as replacing an old water boiler or furnace with a high-efficiency one. These changes offer win-win solutions: the conservation of natural resources and the



protection of ecosystems, as well as economic savings, which can be quite significant over the longer term, especially in the face of rising resource prices such as natural gas.

North Americans spend 90% of their time indoors. Improper ventilation, poor lighting, off-gassing of toxic chemicals from paints, glues, and carpets, contact with harmful cleaning products, and exposure to high or low temperatures can have a profound and detrimental effect on an individual's health and well-being. We can create healthy buildings and improve indoor air quality with eco-friendly furnishings, design and green cleaning products.

Other benefits of greening your building may include improved aesthetics, reduced tenant/owner turnover rates, increased re-sale and rental value of units, and a sense of being part of a larger movement and contributing positively to society.

Multi-family building strata councils and property management companies, among many other stakeholders, have a role to play in advancing sustainability, but they also need help and support. Strata councils often face a number of barriers and constraints, including not being aware of where to find sustainable products and building materials, energy efficient equipment and appliances, and the right contractors to do the work.

Overcoming these barriers and concerns requires a positive outlook, strong commitment and, often, external help. It can be quite a daunting experience to undertake refurbishments, retrofits, upgrades and projects to improve a building's quality and performance. This guide will help you find solutions and help alleviate some of your concerns.

Expert information is widely available

The Vancouver region is blessed with numerous green building and retrofit specialists, including architects, planners, experts in various city departments, non-profit organizations, energy-providing companies, and housing associations.

This green guide was developed with advice and guidance from numerous experts, and provides the most useful, relevant and up-to-date information for strata councils, building management companies, real estate experts, renters, owners and concerned citizens.



Did you know?

Globally, we need to reduce the human footprint. We are in a state of overshoot: By 2008, humanity was using about 40% more renewable resources and waste assimilation capacity than nature can regenerate in a single year.

Source: Global Footprint Network



What should I be thinking about?

Starting your Eco-Strata project

An Eco-Strata initiative starts with the right frame of mind, and getting a sense of the various steps involved in the process. In this section, you will find a range of ideas and guidelines that will help you initiate projects and activities, large and small, in your building.

Get the strata council informed

The strata council is the decision-making body of a multi-family dwelling, and has the mandate to make decisions with the owners' best interests in mind. That is why getting the strata council and residents up to speed about improving your multi-family dwelling's environmental performance is the most important starting point. To help you, the Light House Sustainable Building Centre in Vancouver offers a Green Building 101 Workshop for Stratas and Co-operatives. This workshop, delivered on site at the building, will identify key green building issues and concepts, and will provide everyone with the tools to get started in greening their building. To schedule a workshop, call 604-682-5960 or e-mail info@sustainablebuildingcentre.com.

Create a “green” or sustainability committee

Who really wants to do all of this work alone? Getting a few residents together who are interested in reducing energy costs and improving health and well-being is a good place to start. It is a small but important first step in developing the trust and working relationship necessary to develop an effective green action plan for your building. And you will get to know some of your neighbours a little better!

Strata councils are busy. They have a lot on their plates already and usually change membership annually or bi-annually. For these reasons – whether you are a council member or not – creating a sustainability committee may alleviate the strata's work with regards to “greening” the building. Ideas and project proposals can be developed through the committee and then presented to council for approval. Having a strata council

Our Ecological Footprints

The Ecological Footprint¹ of Canadians — the measure of an individual's or a population's demand for ecologically productive land and water — is currently the fourth-largest in the world, at 7.6 global hectares (gha) per person, while the Earth's biocapacity for each person stands at 1.8 gha.

If the entire world consumed at this rate, we would need three additional Earth-like planets to supply our resources and absorb our wastes sustainably. Clearly, that is not possible. So large-scale transformation is necessary in our society over the coming decade. Although Metro Vancouver is often held up as one of the most livable regions in the world, we have a way to go before we become sustainable. And because we consume far more than most people on the Earth, we have a prime responsibility to do our fair share and take the lead in reducing our Ecological Footprints.

This guide is designed to make footprint reduction a reality by providing helpful tools for decision makers of condominiums and apartments. For an introduction to the eco-footprint concept, see Wackernagel and Rees (1996) *Our Ecological Footprint*

¹ Source: WWF (2008) Living Planet Report 2008. Gland, Switzerland: World Wide Fund for Nature.



member either chair the committee or participate is an important strategic decision, as it creates a “sustainability champion” within the strata council. Also, if your building has a caretaker, it may make sense to invite them as well, especially if they are the ones who select the cleaning products that will be used in the building, for instance.

Don't have much time? Making your building more eco-friendly does not have to become a full-time job. Often, spending two to four hours a week is plenty of time to get the ball rolling, and the more people get involved, the more tasks can be shared with others. In that respect, having a sustainability committee to rely on really makes even more sense by helping you become more effective.

Extra information and ideas on committees are available on www.eco-strata.com.

Know your building

How is your building performing now? Get to know your building better by having an expert conduct a building assessment audit. The audit will look at the state of your building, including the building's envelope, mechanical systems, elevators and interior finishes. The audit will identify deficiencies, and will also be very useful in setting a baseline for your building's current performance against which you can measure improvements.

Complementary to the building assessment audit is an energy audit, which will examine how your building uses energy, and where savings can be achieved through retrofits, adjustments and behavioural change. This will provide you with an energy baseline, and when your energy auditor enters the results from the audit into energy modelling software, you will be able to get a good idea of the payback times for different options. If you are wondering, for example, whether installing a solar hot water heating system is a worthwhile investment for your particular building, energy modelling will enable you to make an informed decision. Also, keep in mind that many financial incentives available through different levels of government can only be redeemed once an energy audit or model has been undertaken.

The Light House Sustainable Building Centre can help you find a contractor to undertake the building assessment audit and energy audit. You can also get in touch with the Society Serving Ourselves Sustainably (SSOS) for help on understanding how your building functions from a more technical standpoint, as residents and strata council members may not be familiar with the mechanics of the building and how it operates as a system. Contact SSOS by phone (604-985-8381) or by e-mail (ssos@4sustainability.com).

Develop an action plan

It's important to put together a plan of action that highlights the

Buildings have big feet

In Canada, buildings are responsible for:

- 33 percent of total energy use
- 12 percent of non-industrial water consumption
- 50 percent of natural resource consumption
- 35 percent of greenhouse gas emissions
- 10 percent of airborne particulate production, and
- 25 percent of landfill waste generation

Source: CEC Report: Green Building in North America: Opportunities and Challenges - 2008



Potential benefits of a green building:

Environmental benefits

- Protect & enhance biodiversity and ecosystems
- Improve air & water quality
- Reduce waste streams
- Conserve & restore natural resources

Economic benefits

- Reduce operating costs
- Create, expand, and shape markets for green products & services
- Improve occupant productivity
- Optimize life-cycle economic performance

Social benefits

- Enhance occupant comfort and health
- Heighten aesthetic qualities
- Minimize strain on local infrastructure
- Improve overall quality of life

Source: US EPA: <http://www.epa.gov/greenbuilding/pubs/whybuild.htm>

steps and initiatives that you are thinking of undertaking. This can include the areas you would like to focus on (electricity; waste; natural gas; etc.), the projects that you are thinking of carrying out to address these (having an energy audit and retrofit; adding recycling bins; etc.), developing a timeline (including anticipated work that needs to be undertaken in the coming years, like building envelope maintenance), and identifying residents or other individuals who might be involved. Your insurance company can advise you on any legal issues that may affect your building's policy coverage and price regarding your retrofits. Also, contact your municipal government about possible building permits.

Think big, but keep it manageable

"Greening" a building is as much a process as an end point; it is a learning experience for everyone involved, and leads to a positive change of which you can be proud. Be careful not to take on too much. Unreasonably high expectations can lead to stress, and your strata corporation may hesitate to take on green efforts in the future. If you start small, you'll build confidence and trust, create a sense of community, and pave the way to greater investments — both in terms of time and money.

Set targets and track progress

Targets are important. They help set the scope of the initiative, and enable project leaders to study various ways the goals may be achieved. Tracking progress is also important. Compare actual outcomes with baseline projections of "what would have been" without the project. For example, if the goal is to reduce electricity or gas consumption by a certain amount, how much of a difference did the investments make? You might look at the hydro or gas bills before and after the refurbishments. Note that the important number is consumption (kilowatt hours or giga joules), since dollar amounts — which we hope will decrease — can fluctuate up or down depending on how much the utilities charge at any particular time. You can track some of your progress on a common website or with graphs and charts displayed in public places for others to see.

Get expert advice

In the Metro Vancouver region, there are many excellent green building experts who can help with projects, from non-profit organizations to professional consultants. The Light House Sustainable Building Centre can help you learn about free and fee-based programmes and services. Anyone and everyone can learn about the "five Ps" of sustainable building: practices, policies, products, projects and service providers.

Ideas are everywhere

Why reinvent the wheel? Your region surely has many examples of green building refurbishments of every type and scale that can be used for inspiration. Read some of the case studies presented at eco-strata.com to see what buildings have been doing to



reduce gas and electricity use, sort waste, address indoor air quality, improve communication with residents, and generally do the right thing for the environment. Watch for regional tours of green buildings, and ask the owners questions.

Balance costs today with benefits in the future

Cost can be a serious barrier for strata councils. However, most energy retrofits pay for themselves in three years or less! Using low-energy bulbs and installing low-flow shower heads and faucet aerators, for example, have a payback time of less than a year. Larger investments like photovoltaic solar panels often start producing “free” electricity within 10 years’ time. The prices of natural resources, especially fossil fuels such as oil and natural gas, are expected to rise steadily, so the payback time for green projects should decrease. Subsidies, tax breaks and renovation loans are also available to make purchasing certain equipment more affordable. “Green” retrofits can be seen as investments rather than costs, and payback times should be a major consideration, but not the only deciding factor.

Life cycle thinking

Life cycle thinking — taking into account how a product is manufactured and disposed of, as well as how it is used over its useful life — helps to define products’ full environmental impact. In Southwestern BC, for example, where it is neither very hot in summer nor very cold in winter, changing a building’s windows to save on cooling and heating is a very costly investment that is both resource- and energy-intensive. The overall negative environmental impacts may outweigh the marginal energy savings. Over a longer span of time — say, 20 years — the window change may be worthwhile in terms of overall energy balance. Put simply, it may not be beneficial overall to replace an old product or device if the very act of changing it places a higher burden on the environment. It’s important to talk to an expert, to weigh the pros and cons carefully, and to make an informed decision.

Identify and address challenges

Early identification of possible barriers to a refurbishment project is important, so you can avoid hassles later. Here are a few key questions to keep in mind:

- Who is the main contact person for the project? Is it the strata management company’s agent, a strata council member, or a resident?
- Do any parts of the project require building permits or City Hall approval?
- Will proposed refurbishments have an impact on the building’s insurance policy (and possibly costs)?
- Does your local fire department need to be consulted (for modifications to the HVAC system, for example)?
- Do you have an effective communication and outreach

Do you have these concerns? Are you faced with these difficulties?

- Lack of time
- Too much information
- Concerns about costs, particularly high upfront costs and long return on investment
- Uncooperative owners, strata councils, decision-makers
- Resistance to change
- Preconceived notions about, or unfamiliarity with, certain technologies or ways of doing things
- Uncertainty about the pros and cons of various options
- Fear of being held accountable for green choices
- Concern about breaching strata insurance terms, building bylaws or the Strata Property Act of BC
- The feeling of ‘going at it alone’





- strategy in place to let residents know about the important details of a project, if and how they can get involved, etc.?
- Are the trades companies involved reliable? Is their work guaranteed?
 - Does the budget seem accurate? Where will the money come from? Is the budget significant enough to require a $\frac{3}{4}$ vote from the residents at an Annual General Meeting?
 - Does the strata corporation or property management company have some flexibility if there are unanticipated costs or budget overruns?
 - Can the project be linked to work already anticipated for the building?

Every building is different, and so are Eco-Strata projects, so sitting down with the various stakeholders to ask for feedback and to discuss potential barriers is probably a good team-building strategy that will lead to positive outcomes and minimize risk.

Getting started: Simple changes in the building and common areas

Lighting

We need lighting for convenience and safety, but it's responsible for about 16% of a home's electricity consumption¹. There are many ways to conserve energy use, such as installing timers and motion detectors where appropriate, using low-energy bulbs or retrofitting older fixtures. Some of the best options are discussed below. See eco-strata.com for links to more information on lighting.

Compact fluorescent lights (CFLs)

Changing the light bulbs from the conventional incandescent kind (that produce heat) to low-energy, CFL bulbs is one of the easiest steps to take both in a condo/apartment, and in common and public areas. CFL bulbs consume approximately $\frac{1}{4}$ of the energy, and last 10 times longer. It's a low-cost investment that quickly reduces electricity consumption. They're widely available and now

¹ BC Hydro: <http://www.bchydro.com/powersmart/newhomes/newhomes45535.html>

cost little more than traditional bulbs.

CFLs are best installed in fixtures that are used frequently and left on for at least 15 minutes at a time (switching CFLs on and off frequently can shorten their lifespan), so buildings' common areas, including outdoor patios and spaces, garbage rooms, lounges and foyers – as well as in individual apartments and condos – are all ideal locations for CFLs. Note that only certain CFLs can be used in dimmable fixtures. Some people remain sensitive to the bluer light given off by CFL bulbs, even though their tone has improved greatly since they were first introduced. Low wattage traditional bulbs (e.g., 40 watts) may be a practical alternative.

CFLs do contain trace amounts of mercury — about 1/5 of what you would find in an average watch battery — so used bulbs should be recycled appropriately. See eco-strata.com for a list of Lower Mainland retailers who take them back for recycling, and for more information. Do note that, in many jurisdictions, more mercury would be released by burning the coal needed to light an ordinary incandescent bulb.

Light-emitting diodes (LEDs)

An alternative to CFLs are LEDs, which consume even less energy. LEDs are found everywhere from computers, to ambient street lights, to flashlights. Screw-in LED bulbs that can replace conventional light bulbs do exist, but are still difficult to find in the Metro Vancouver region, and can be expensive. They can be purchased online from a number of manufacturers.

Fluorescent lights

Fluorescent lights are the most common lights in schools and in office buildings, and can be found in homes too. Newer 'T8' fluorescent lamps with electronic ballasts are now the norm, replacing the older T12 lamps and magnetic ballasts.

Pulse-start metal halide lights

Despite their sci-fi name, pulse-start metal halides are about three times as efficient as incandescent bulbs. They offer high light output per unit of energy, and a long lamp life. They're ideal for permanently lit areas such as underground parking areas, or for lights that go on at night outside a building. More information can be found at eco-strata.com.

High-pressure sodium lights

Primarily used for outdoor and garage lighting, high-pressure sodium lights are an effective energy-saving alternative to incandescent bulbs. More information can be found at eco-strata.com

Fast Fact

BC Hydro estimates that replacing an old 100-watt bulb with a 25-watt CFL will save approximately \$30 of electricity over the CFL's life.

For additional suggestions and useful tips, turn to the Tools and Insights section at the end of this guide. It builds on what is presented here, and provides information on everything from conducting effective meetings to communication and outreach, and working constructively with your colleagues and neighbours. There's also more information online at www.eco-strata.com.

Remember, this guide is a living document, and is part of an ongoing dialogue between the thousands of people who are trying to green their existing multi-family buildings. Your experience with what works and what's easy – as well as your personal stories – are things we and many others will benefit from. Share them on www.eco-strata.com

www.eco-strata.com



Fast Fact

LED exit signs can last about 25 years, but do have a higher initial cost. Using CFL bulbs in an exit sign would typically last between two and four years, and incandescent bulbs would require replacing several times a year.



Automatic lighting controls

Automatic lighting controls are an effective and low-cost means to save energy. For the most part, they're very quick and simple to install.

Timers

Timers are affordable and easy to operate. Depending on the model, they can be programmed to turn lights and appliances on and off over a 24-hour period or seven-day period.

Motion / occupancy sensors

Motion sensors are commonly found in outdoor areas such as decks or courtyards. When motion is detected, the light goes on, and remains on until movement stops. Motion sensors can also be installed in common areas such as a building's 'party room,' storage rooms, laundry room, hallways and landings.

Photocells

Photocells control lighting based on the amount of ambient light, and are a good choice for outdoor security lights, which turn on as daylight dims, and turn off when the sun comes up. Photocells can be paired with a timer, so lights go on as evening sets in, but then turn off automatically after a pre-set amount of time if it is not necessary for the lights to stay on all night.

Exit signs

Because exit signs are always on, they should definitely be on your list of projects to reduce energy consumption. Old-style exit signs are lit with incandescent bulbs; you'll know them because they feel hot to the touch. One option is to retrofit the sign with CFL bulbs. Other options include installing LED lights using a retrofit kit, or replacing the sign altogether with an LED one, which can save 90% in operating costs. BC Hydro estimates that each changed sign can save over \$25 of electricity per year. You can learn more at eco-strata.com.

Domestic hot water

In many multi-family buildings, hot water comes from common hot-water boilers, rather than from individual water heaters as in single-family homes. These large tanks are typically set to 60°C (140°F), but this can be dropped by a few degrees to a lower safe level, such as 55°C (131°F), to save on energy. CMHC estimates the savings in fuel consumption at 1% per degree



Celsius (or 2.5 degrees Fahrenheit). However, the Canada Safety Council recommends that the water temperature be set to at least 54°C (129°F) to prevent water-borne diseases.

In addition, buildings equipped with domestic hot water recirculation pumps can further benefit from a timer that shuts off the pump during periods when there is little demand for hot water². A 24-hour mechanical time clock allows the user to set different on- and off-times during the day, such as in the middle of the night or for part of the afternoon. Should a resident want hot water during shutdown, she or he must simply run the water long enough for the hot water to make its way to the tap. A seven-day time clock adds the possibility to accommodate for a different shut-off period for weekends.

Also, the hot-water boiler should be flushed annually by an expert to remove residues and deposits that have accumulated inside. This will help keep heating costs down and will significantly enhance the lifespan of the boiler.

Insulation

The cheapest and cleanest energy is the energy that you don't consume. Air sealing keeps the cold out and improves comfort. It's also a cheap and fast energy-saving measure. Check for air leaks by holding a lit candle or incense near doors, windows, cracks, joints and light fixtures. The smoke will reveal any drafts, which can then be corrected. A more comprehensive approach involves contacting a home energy advisor to undertake an energy audit of the building, which usually includes detecting drafts and checking for air leaks.

Caulking

Caulking is ideal to fill any crack or opening that should be permanently sealed, between surfaces that do not move relative to each other. Caulking can be used inside to prevent heat from escaping and outside to prevent moisture from entering the building. Siliconized caulking is suitable for smaller cracks and spaces. For larger ones, use expanding insulation spray foam. Learn more at eco-strata.com.

Weather stripping

A complement to caulking is weather stripping which is installed in mobile joints — typically around door and window frames — to get an airtight fit. It usually comes in rolls of adhesive-backed foam tape available in various widths and thickness, but can also include door sweeps that create effective seals between the bottom of the door and the threshold. Learn more at eco-strata.com.

² CMHC: http://www.cmhc-schl.gc.ca/en/inpr/bude/himu/waensati/waensati_028.cfm





Pipes

Warm air contacting uninsulated cold water pipes can cause condensation and dripping. Hot water circulating in unprotected pipes can cause heat loss. An easy fix to accessible pipes is to install preformed foam wraps or sleeves around the pipes. These pipe insulators are widely available in hardware and plumbing stores and can be mounted in seconds.

Pools and hot tubs

Pools and hot tubs are big energy users, and evaporation is the largest source of heat loss. Keep the heat in the water with floating pool and hot tub covers. For even better heat retention, add a thermal blanket as well. They can reduce heat loss by 50% for an indoor pool, and by 70% for an outdoor one. Another energy conserving measure is to decrease the water temperature of hot tubs and pools in the summer; in fact, you may even wish to turn off the hot tub entirely.

Interior refurbishments

Interior refurbishments are opportunities to renew and modernize indoor living spaces, while also adopting healthy and sustainable materials for positive health and environmental benefits. Indoor air quality can also be improved by furnishings and products. Eco-friendly cleaning products and low-emitting carpets, glues and paints can improve indoor air quality, reducing negative impacts on health and well-being. Here is a sample list of products that can be considered for interior refurbishments:

Paints and finishes

Look for paints with no volatile organic compounds (VOCs) and other toxic substances. Clay-based interior finishes and paints offer an increasingly popular, non-toxic alternative to conventional paints.

Tiles

Beautiful, recycled glass tiles that come in every shape and colour are suitable for both indoor and outdoor use. They resist staining and discoloration and are easy to clean.

Flooring and carpets

Wood, cork, tile, bamboo and rubber are some of the many alternative flooring materials available. For wood floors, locally reclaimed wood is best, but alternatives include Forest Stewardship Council (FSC) certified wood from domestic or exotic sources. Bamboo is also a great option. It's very durable and resistant to moisture, and comes from a quick-growing plant. Some companies offer carpet tiles from recycled or recyclable materials, and others make 100% wool carpets.

Insulation

Alternatives to conventional fiberglass include natural cotton fibre insulation which often contains high levels of post-industrial recycled content, as well as cellulose (fiberized or recycled paper), and expanded polystyrene.

Cleaning supplies

Look for products that are biodegradable and that do not contain petroleum products, bleach and phosphates. Several labels exist, in particular the “Environmental Choice” EcoLogo for products in North America. More information is available at eco-strata.com.

Landscaping: Green your green space!

Many social benefits are linked to landscaping. These include health, conservation, biodiversity and landscape aesthetics.

Herbicides, pesticides and fertilizers are a serious health issue, affecting us and our pets through direct contact, as well as through contamination of the water table and food chain. They're also responsible for the dramatic decline of pollinators. Instead, remove weeds by hand and use compost or organic soil to keep plants healthy. Ideally, on-site composting reduces waste and “closes the nutrient loop” by providing plants with nutrient-rich organic compost. Learn more at eco-strata.com.

Noise pollution can also be a problem: Gas-powered landscape equipment such as leaf blowers or chain saws typically produces 85 db to 100 db of noise—enough to cause permanent hearing damage to anyone nearby, and stress to those within hearing range. Hand-powered tools are best, but electric ones are great alternatives. If a gas-powered tool is imperative, then opt for a four-stroke engine, rather than the noisier, oil-burning and much more polluting two-stroke.

Southwestern British Columbia has a very distinct climate—long, rainy winters and dry summers, with temperatures typically ranging between 0°C (32°F) to 30°C (86°F) — so choosing native plant species ensures maximum plant resilience, and protects the local biodiversity. To conserve water, install a drip irrigation system set on a timer, and collect rainwater: it's free and abundant! An even lower-maintenance, eco-friendly alternative to plants that uses no water at all is the installation of gravel, pebbles or pavers, particularly the water-permeable kind, allowing the water to drain into the soil, thus restoring the water table, and relieving the storm sewers on rainy days.

Finally, a landscaping committee composed of building residents and/or members of the strata council might discuss landscaping

Did you know?

The average Canadian produces just below 500 kg of waste per year. In Metro Vancouver, residents and businesses generate over 3.5 million tonnes of waste a year, with the biggest contributors to the waste stream being wood and paper (14%), and food (13%).

Source: Metro Vancouver



options, and even recruit individuals to help out with the gardening. There are also many professional 'eco' landscaping businesses in the Metro Vancouver area. A list is available at eco-strata.com along with more information.

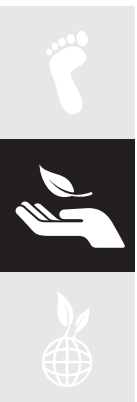
Waste and recycling

Currently, 52% of total waste in Metro Vancouver is recycled, while the other 48% is collected and taken to one of two landfills or to a waste-to-energy facility. Notably in 2008, Metro Vancouver launched the Zero Waste Challenge, an ambitious programme which sets out to minimize the amount of waste going to disposal by using opportunities to reduce, reuse, recycle and recover. The goal is to divert 70% of solid waste by 2015.

Strata councils can help this effort by providing residents with better waste-reduction and recycling information. By law, many items are banned from the garbage by Metro Vancouver, so they must be recycled through existing curbside or blue box recycling programmes, removed through various take-back schemes, or brought to a recycling and/or waste facility such as one of the Lower Mainland's seven Transfer Stations for proper disposal. A complete list of banned items can be found on eco-strata.com.

10 steps for better waste recycling and disposal in your building

1. Print out the Metro Vancouver Banned-from-the-Garbage list and post it in the mailbox room or on the building's notice board, as well as in a prominent location near the garbage bins.
2. Conduct a small waste audit to get a better picture of what is being recycled and what isn't, how many banned items are getting thrown out, and so forth.
3. Meet with your sustainability committee members / neighbours / strata council members to identify current challenges regarding waste disposal and recycling in the building (lack of space; lack of cooperation by residents; insufficient recycling bins; etc.) and discuss strategies to address these concerns.
4. Space permitting, create a swap platform near the garbage and recycle bins where residents can leave items like books, used electronics, sports equipment, etc., that can still have a second (or third) life for others to pick up. Simple instructions could include telling people to leave an item for, say, a two-week period, and to dispose of it appropriately (by giving it to charity or dropping it off at a transfer station) if it is not adopted in that time frame.
5. Add extra recycling bins to facilitate the collection of



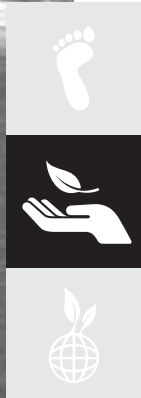
recyclables that are not picked up through the regular blue-box program, such as empty milk cartons, plastic shopping bags and dead household batteries. Other recyclables can include electronics, wood, and Styrofoam. Create home-made laminated labels for the bins, and see whether a resident or the caretaker can drop these off at one of the Return-It or other recycling locations in the Lower Mainland.

6. Invite the strata council to adopt rules that require residents to recycle and dispose of discarded items as the law requires. The strata corporation can fine owners up to \$50 for a breach of rules.
7. Draft a note informing residents of your efforts to improve recycling and waste disposal in the building, and remind them of Metro Vancouver's list of banned items from the garbage as well as your building's rules and bylaws on this matter, if applicable. You can also take this opportunity to ask residents to provide feedback about current initiatives and invite them to make suggestions for improvements. This note can be slipped under doors and posted on the building's notice board.
8. Consider mounting a security camera in the waste and recycling room if you are finding that many banned items are being thrown into the garbage despite your efforts to provide information and alternatives.
9. Call your local recycling council. In BC, the Recycling Council's Hotline is 604-R-E-C-Y-C-L-E (604-732-9253), Monday to Friday, 9 am to 8 pm; Saturday, 9 am to 4 pm, or e-mail them at hotline@rcbc.bc.ca if you have any questions about what can be recycled and where. For more information, visit www.rcbc.bc.ca.
10. Start or improve a waste recycling program in your multi-residential complex by contacting a Sustainable Business Advisor at Metro Vancouver at 604-451-6575, or by e-mail at business_services@metrovancouver.org for a no-cost assessment.

Other useful links can be found at eco-strata.com.

Building maintenance: 'Better to prevent than to cure!'

Proactive building maintenance simply makes good financial and ecological sense. Proper maintenance means fewer repairs



and costly replacements, and less waste of natural resources in the long run; it also means fewer hassles for strata councils and residents. Wise management requires that regular investments be made to have the building's envelope, windows, furnace and HVAC system checked, as well as keeping track of water, gas and electricity consumption to identify unexpected increases. Have a building assessment audit done for your multi-family dwelling, as it will provide some invaluable information with respect to your building's current condition, and where efficiency improvements as well as repairs are needed.

Important changes in individual apartments and condo units

Working towards sustainability is everyone's responsibility. Although strata councils and property management companies typically can't regulate and impose changes in residents' apartments and condos, they can nevertheless encourage individuals to take certain steps that will green their living by providing helpful and detailed information. The items in this section offer tips that apply to both individual units and to a building's common areas such as for common toilets, showers and laundry rooms.

Water

At 329 litres per capita per day³, Canada is ranked the second-largest water consumer on the planet. British Columbians use more water per capita than residents of any other Canadian province.

Even though BC is blessed with abundant freshwater, that water is a very precious commodity that is under increasing stress

³ Environment Canada: http://www.ec.gc.ca/WATER/en/info/facts/e_domestic.htm



from climate change and the demands of a growing population. Natural Resources Canada indicates that a leak of only one drop per second wastes about 9,000 litres of water per year⁴, or the equivalent of 16 baths every month! Some simple measures can help to reduce our 'water footprint.'

Examples of ways to save water around the home and in common areas of a multi-family dwelling can be found at eco-strata.com. For the most part, these involve low-cost, off-the-shelf technologies such as faucet aerators that can make a significant dent in water consumption (and energy in the case of hot-water savings).

Toilets

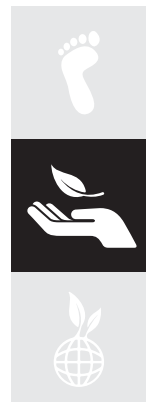
According to CMHC, toilets use more water than any other household device, accounting for about 30% of overall consumption. Ultra-low flow toilets, which use 6 litres of water or less, and dual-flush toilets, which have a short flush of 3 litres and a long flush of 6 litres, are widely available and contribute to significant water savings. In fact, they are now mandatory in the new BC Building Code for new homes. An alternative if you have a 13- or even a 20-litre toilet, and are not planning on changing the toilet quite yet, is to add some bricks or a plastic bottle filled with water, pebbles or sand in the tank. This will reduce the amount of water stored in the tank and save water with no loss of flushability.

Faucets and shower heads

After toilets, showerheads use the most water. Low-flow showerheads can reduce water use by as much as 50%⁵ without changing water pressure. Look for showerheads with flows of 9.5 litres/minute (2.5 gallons/minute) or less, with the best at around 3.8 litres/minute (1 gallon/minute). Faucets in kitchens and bathrooms can be fitted or retrofitted with simple, inexpensive aerators with flows as low as 2 litres/minute (0.5 gallons/minute). Low-flow showerheads and faucet aerators are widely available in hardware and plumbing stores. Showerheads cost somewhere between \$10 and \$50; faucet aerators typically cost between \$2 and \$10.

Cleaning decks in winter

If you live in a concrete building, washing your deck in winter should be avoided. Although decks on condominiums are usually built with an insulation barrier between the deck and the building, adding water to the deck in winter can cool it tremendously and will most certainly pull some of the heat out of the adjacent room.



⁴ Natural Resources Canada: <http://www.oeo.nrcan.gc.ca/residential/personal/new-homes/water-conservation.cfm?attr=4>

⁵ CMHC: http://www.cmhc-schl.gc.ca/en/inpr/bude/himu/waensati/waensati_020.cfm

Fast Fact

A gas pilot uses somewhere between 750 and 1,500 BTUs of gas per hour; let's use an average of 1,000 BTUs for this example. If you multiply that by 24 hours in a day, by 365 days in a year, and by 1,055 joules (J) per BTU, that amounts to 9.2 GJ of gas per year. At Terasen's Rate 3 gas rate of \$12.956/GJ (as of July 1, 2008), that amounts to \$120/year—or \$10/month—of gas just to keep that gas pilot on!

Gas fireplaces

Over the last 10 to 15 years, many multi-family homes built in the Lower Mainland include in-suite gas fireplaces. People enjoy having a gas fireplace in their home as it provides comfort and beauty. It also requires very little maintenance. While some models are designed to provide heat, others are purely decorative. Gas fireplaces, along with the production of hot water and heating the air of common areas, make up virtually all of the gas consumption in a multi-unit residence. As the price of natural gas continues to rise due to demand and growing scarcity, and as extra costs such as carbon taxes are added to fight climate change, it is definitely wise to pay attention to how gas fireplaces are being used and maintained.

Does your building pay collectively for natural gas? In most cases in the Lower Mainland, gas is metered collectively in a multi-family dwelling, and owners and renters pay for gas through strata fees. Although this simplifies billing, it may not be fair to those who consume less. Terasen Gas is currently experimenting with a device in several multi-family dwellings in the Lower Mainland that monitors individual consumption, thus allowing strata councils and building owners to charge individual owners based on their actual consumption.

In a multi-family dwelling, the Strata Property Act of BC stipulates that owners are responsible for the repair and maintenance of their unit and this includes gas fireplaces; in other words, the strata council cannot compel owners to have their gas fireplaces inspected and cleaned, unless owners agree to relinquish gas fireplace maintenance and upkeep to the strata corporation through a $\frac{3}{4}$ vote during an Annual General Meeting. In the meantime, the council can still reach out to owners and renters and encourage them to undertake the following in an effort to save gas and money, and to help ensure the safety of the gas fireplaces:

- Have the gas fireplace cleaned and inspected by a certified professional at least once every two years (many gas fireplace manufacturers actually recommend this be done annually)
- Install a thermostat that shuts the fireplace off when a desired temperature is reached
- As an alternative to the thermostat, install a timer so that the fireplace shuts itself off after a desired period of time
- Install a heat blower with variable-speed fans to send the heat into the room, thus significantly increasing the efficiency of the fireplace
- Replace a decorative gas fireplace with a heat-producing one—preferably EnerChoice certified
- Turn off the gas pilot in the spring to reduce the amount of



heat in the unit over summer months, and to save gas (see FACT box, above)

Many gas fireplace servicing companies offer group discounts for multi-family dwellings to service their fireplaces, typically when 20 or more units ask for this service together. Late September onwards is a busy season for these companies, so calling in advance to enquire about prices and posting a sign-up sheet for residents over the summer can save a lot of hassles and money and have the gas pilots relit in time for the fall season.

Washers (shared or in individual units)

Front loading horizontal washing machines use between 35-45% less water and 60% less energy than top-loading vertical washing machines. Although they do cost a bit more than conventional units, they are a worthwhile investment for cleaner clothes, as the clothes tumble in-and-out of the wash water as the horizontal cylinder rotates. This is especially true if there is a shared laundry facility. They also reduce the amount of wash water, detergent and energy required. Ensure that the washer is Energy Star.

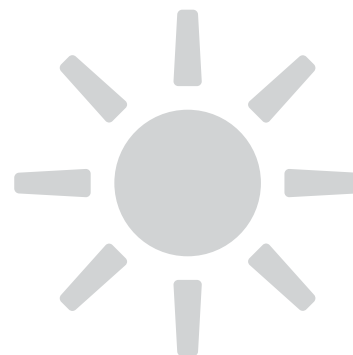
Don't forget to keep the water temperature low! Very hot water is no longer necessary to get clothes and linen ultra clean; save energy by setting the water temperature to warm (30°C or 86°F) or even to cold. Many detergents now are designed to work well in cold water.

Drying laundry

Admittedly, trying to dry laundry without using a clothes dryer can be a challenge in a multi-family dwelling. Issues such as slow drying, humidity build-up and bylaws that restrict residents from drying laundry on patios and outdoor spaces are just some of the barriers. Use of dryer racks or balls will help to minimize clothes dryer use, or at least make it more efficient.

Drying racks

Small, foldable drying racks are very convenient for drying laundry in well-ventilated areas, particularly in the summertime when it is warm and sunny out. Using them saves energy, and reduces the electric bill. These racks are often discrete enough to be placed on a deck without attracting attention, but if this is not permitted in the bylaws of the building, then a second-best alternative would be to keep the rack just inside the unit—so you still benefit from sun and wind. Air-drying laundry also reduces wear-and-tear on fabrics, and decreases dryer-vent cleaning. There is a growing movement across the Lower Mainland and the



rest of Canada dedicated to drying laundry naturally such as Let's Hang Out Canada: <http://www.letshangoutcanada.com/>.

Dryer balls

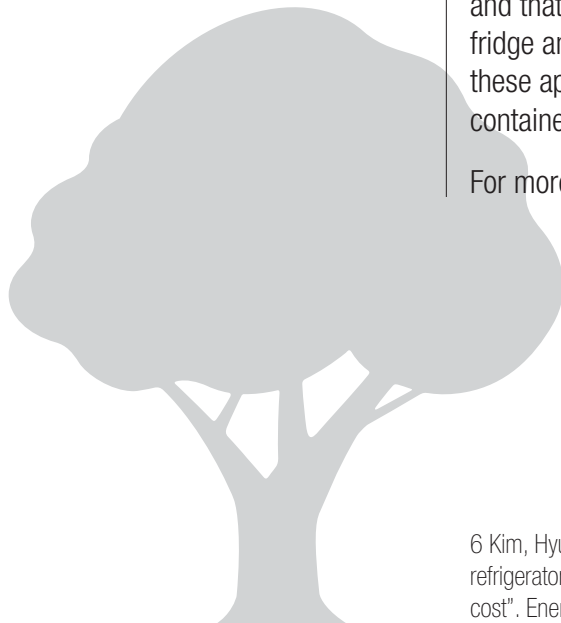
Dryer balls are an effective way of getting laundry to dry faster (5 – 10% savings in drying time), thus reducing energy consumption. These spiky rubber balls fluff out laundry as it spin dries. They're readily available across the Lower Mainland.

Refrigerators and freezers

The temperature inside your fridge should be between 2°C (35°F) and 4°C (39°F), and -18°C (0°F) for the freezer. BC Hydro warns that keeping the temperatures just 5°C cooler than the recommended temperatures can increase energy use by as much as 25%; a small thermometer can help set the temperature of your refrigerator accurately.

Old fridges were built to last, but use more electricity — sometimes more than twice as much — than modern and efficient ones. However, from a lifecycle perspective, replacing a fridge may not be the best way to conserve energy and resources. A new fridge requires energy and resources to build, and an old fridge requires energy to be disassembled and partially recycled, and also produces waste. A recent study conducted in the US on refrigerator life cycle indicates that typical mid-sized 1994 models or older should be replaced to save both energy and money⁶, so this can be used as a rule of thumb. New fridge or old fridge, there are a couple of things to do to reduce energy consumption. Firstly, ensure that there is enough ventilation space around the condenser coils of the refrigerator (usually found at the back or underneath the fridge), and that these are vacuumed periodically. Secondly, keep the fridge and freezer full to help retain the overall coolness inside. If these appliances are not filled to capacity, then a few water-filled containers will help.

For more information, visit eco-strata.com.



⁶ Kim, Hyung Chul, Gregory A. Keoleian, and Yuhta A. Horie. "Optimal household refrigerator replacement policy for life cycle energy, greenhouse gas emissions and cost". Energy Policy CSS06-07 (2006): 2310-2323



Automatic lighting controls for the home

Automatic timers are a good idea for the home; they can be very effective on a gas fireplace, on lights in a walk-in closet, on bathroom exhaust fans, or on any other equipment that only needs to be “on” as long as it is needed. Occupancy sensors can also be used throughout the home, where lights are turned on and off automatically depending on the presence or absence of people. Both occupancy sensors and timers are easy to install.

Installing power bars for appliances

Many of the electronic devices that we have at home — from DVD players, TVs, video games, modems, printers and scanners — use electricity when they are in standby mode, or even turned off. If your appliance has a clock, then it’s constantly drawing power. Power adapters — those black boxes at the end of the power cord used to recharge your cell phone, for example — also draw energy when they are plugged in regardless of whether they’re connected to a device. Also, cordless telephones and other cordless items such as toothbrushes and tools don’t require constant charging in order to function. An easy way to ensure that no electricity is consumed by these devices is to plug all electronic equipment into a power bar that can be shut off with the flick of a switch and can be placed within easy reach. This may not work for programmable devices such as entertainment systems, but is perfect for those appliances you only need plugged in when you use them.



Larger investments: The next steps to greening your multi- family dwelling

Virtually all of the retrofit and refurbishment recommendations made in this guide are relatively low in cost and can lead to impressive savings in water and energy use, and increase quality of life. For the most part, these are steps individuals can take themselves. Many can be completed by a hired contractor, including fairly simple upgrades such as changing light ballasts and installing light sensors. These are the ‘easy pickings.’ If all multi-family dwellings in the Lower Mainland followed these fairly simple steps, our Eco-Footprints would ultimately be a lot smaller.

The next steps, which are not covered in this guide, include more significant upgrades such as:

- Changing water boilers
- Adding rooftop solar cells to produce hot water or electricity
- Reinsulating a building’s envelope and/or roof
- Modifying or replacing the Heating, Ventilation and Air Conditioning (HVAC) systems for more energy-efficient performance
- Changing a building’s windows to Energy Star/high-efficiency ones

Despite their (often) high upfront costs, strata councils should consider making such investments when the “low-hanging fruit” have been picked, when windows, water boilers, etc., are nearing the end of their natural life cycle, or simply if the building’s budget permits it. Keep in mind the possible incentives such as low- or no-interest loans, subsidies and tax breaks that are offered to help defray some of the costs. If you wish to pursue such larger investments, we recommend you get in touch with the Light House Sustainable Building Centre in Vancouver or an organization such as the Society Serving Ourselves Sustainably, who will discuss options with you.



Tools and insights

Bylaws and rules to support your building's sustainability efforts

A strata corporation may adopt bylaws and rules that can potentially regulate the use of property for owners, tenants, residents and guests, but also for the business practices of strata.

The Strata Property Act & Regulations apply to every strata corporation in the province of British Columbia. They come with a standard set of bylaws that pertain to administration of the strata and the use and enjoyment of common property, common facilities, strata lots, and individual behaviour to ensure a harmonious environment.

Bylaws may provide for the control, management, maintenance, use and enjoyment of strata lots, common property and common assets of the strata corporation and the administration of the strata corporation. Bylaws are amended at an annual or special general meeting of the strata corporation, and they are ratified by a 3/4 resolution of those persons at the meeting who vote in person or by proxy and who have not abstained from voting. Once they are adopted, they must then be filed in the Land Title Registry before they become enforceable.

Rules may be adopted to govern the use, safety, and condition of the common property and common assets of the strata. Rules may be created by the strata council, and must be ratified by the owners at an annual or special general meeting by majority resolution of those persons at the meeting who vote in person or by proxy who have not abstained from voting. If council creates a new rule, it must be set out in a written document and the owners and tenants must be informed of any new rules as soon as feasible. Rules do not apply to the use and enjoyment of a strata lot or administration of the strata corporation.

When adopting a new rule or a bylaw, strata corporations are advised to seek a legal opinion on their enforceability. Bylaws and rules are not enforceable if they: a) contravene the Strata Property Act, Regulations, the Human Rights Code, or any other enactment of law, b) destroy or modify an easement created under section 69 of the Act, or c) prohibits or restricts the right





of an owner of a strata lot to freely sell, lease, mortgage or otherwise dispose of the strata lot or an interest in the strata lot.

Examples of bylaws

The strata corporation must use energy efficient components on all building mechanical and electrical systems upgrades

Window upgrades must be the highest standard possible of energy upgrades

Proper ventilation must be maintained within common areas and strata lots to prevent condensation within the building systems

Dryer vent lint traps must be cleared before each dryer load to ensure maximum exhaust and energy performance

Gas for fireplace pilot lights will be turned off from May 1 - October 1 each year to save energy and costs. All fireplaces will be serviced by the strata corporation prior to restarting the fireplace. Owners will be responsible for any costs relating to technical components and associated labour charges

Examples of rules

Owners must not leave lights on in lockers or storage areas when not in use

Building recycling is mandatory. All recycling must be sorted according to the type of materials and deposited in the designated bins

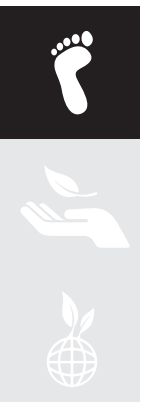
Idling of vehicles in the underground parkade is strictly prohibited

Charging facilities for owners with electrical vehicles are available on request. Each owner will be required to enter into a user agreement with the strata corporation and be billed on the system according to use

Composting is encouraged in the allocated units. Only green waste may be deposited. Compost materials will be used on common area plantings

Become a change agent in your building... and in your community

Being engaged and actively involved in your building, neighbourhood and community can be a powerful source of change. By coordinating your efforts with others like you, you are able to affect change in ways and at a scale that would be difficult or impossible alone. This type of community involvement and outreach is part of the social fabric that brings people



together, helps to bridge differences through dialogue, and leads to a network of trusting relationships and a positive social environment that are key to community building. This includes being part of a green committee in your building and can extend to other engagement in your community. If you would like to become a more active citizen, you can browse through resources available on www.eco-strata.com.

Reach out to other residents

Good communication requires planning and forethought. There are numerous effective ways to reach out to neighbours in your multi-family dwelling, including:

- Providing information in strata minutes
- Sliding notices/letters under peoples' doors
- Dropping a note in residents' mailboxes
- Developing a database of e-mails
- Posting the information on the building's website
- Posting notices in the elevator
- Posting notices in the mail room or on the notice board
- Organizing a special meeting for residents
- Presenting ideas/plans/information at the Annual General Meeting

Depending on what you are trying to communicate, you may want to include answers to questions such as:

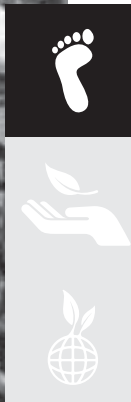
- What is the timeline?
- Will residents be kept informed of developments? How? What kind of follow-up will there be?
- Can others get involved in the process? If so, how?
- Who is the contact point? How does one get in touch with her/him?


To be most effective, ensure that the content of your message is clear and informative. Don't forget to have someone proofread any notice or message to check for clarity, accuracy and grammar!

Communicate well

Communicating well is surely one of the most important keys to success, and a strong determinant regarding your effectiveness as a change agent; it applies to virtually all aspects of life, and not least to the sustainability projects you are initiating in your building. Good, clear communication will help get buy-in and support from residents and strata council members. Communication is, for the most part, a learned skill, and there are many resources available for those who wish to improve in this area. Do not underestimate the influence that body language, posture, eye contact and tone of voice have in the communication process, in addition to your choice of words and ability to present ideas clearly.

In terms of language, you may want to use words like "health", "durability", "savings", "payback", "investment", "well-being" and





so forth when talking about a project and its potential benefits. Although the environmental benefits of greening a building, such as resource conservation, are key factors that drive the decisions of some individuals, many are primarily concerned about an initiative's economic bottom line, or may be swayed by health concerns for themselves and their families.

A large part of successful communication is the ability to sell (an idea; an initiative; a product...). The www.eco-strata.com website features several resources on giving good presentations, improving your communication skills and working with others.

Conduct an effective meeting

Many individuals do not feel particularly comfortable in group settings such as meetings, especially if they do not have the opportunity to regularly participate in, or even facilitate, them. As a champion for "green" initiatives in your building, your capacity to call meetings and chair them will be a huge asset. Indeed, holding meetings is important insofar as it allows residents to define and work together towards a common goal through dialogue in a face-to-face setting. Effective meetings can not only lead to great ideas and a list of action points worth pursuing, but also help to build the necessary support by involving the very people who will then be determining whether a particular project should move ahead or not. If you have little or no experience with organizing and/or chairing meetings, you can search the Internet for resources. The www.eco-strata.com website features websites that provides useful tips and advice.

Look for a contractor

When looking for a contractor, it's always good to:

- Ask for three quotes. The cheapest offer may not always be the best, but at least you will have an idea of the price range. You may wish to ask about the anticipated pay-back period if comparing green with more standard options.
- Check if the company is listed with the Better Business Bureau. It's a quick and easy way to check a company's record, and see whether it is in good standing with customers.
- Get a detailed cost breakdown and a timeline for the work. Get it in writing!
- Ensure you are protected and have liability insurance.



Treading lightly: Buildings and beyond

About a third of our per capita footprint is attributable to how our buildings are built and operate. This is significant and a great place to start tackling the sustainability challenge. Beyond greening our buildings, about two-thirds of what influences the size of our footprint is a consequence of our consumption patterns: the clothes we buy, the cars we use, the foods we eat, and our overall demand for goods and services. Canadians have the fourth largest Ecological Footprint per person in the world, which translates into rates of consumption that cannot possibly be extended to all of the world's people, so our efforts must include actions that go beyond greening our homes and workspaces. As citizens, we can make a substantial contribution to help reduce pressures on natural resources and ecosystems. We can adopt more frugal lifestyles that are substantially less dependant on fossil fuels: happily, this is often shown to lead to more fulfilling and rewarding lives! We also need help from our governments. They must invest in the types of infrastructure that help us make sustainable choices and allow us to tread more lightly on Earth, like taking public transit, using renewable energy, purchasing organic foods and fairly-traded products, and enjoying green and healthy buildings.

Final words

This guide aims to make taking the first steps to greening a multi-family dwelling accessible through a set of clear recommendations and explanations regarding alternative choices and technologies. You are equipped with some key tools to initiate the journey of taking your multi-family dwelling down a green path. We hope you will find it to be an enjoyable and fulfilling one, one that brings real improvements and savings as well as a sense of contributing positively to sustainability and to your community. Making your building healthier for its occupants, and better in terms of water and energy consumption, is a great example of implementing the “think globally, act locally” adage.

As owners, renters, strata council members and property management companies, we all have responsibilities and an important role to play in facing up to this challenge. Each and everyone one of us can make a difference, regardless of how big or small it is. To remind us of that, an African proverb states that “If you think you’re too small to have an impact, try sleeping with a mosquito in the room.”



eco-strata guide

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