



Alber ta
**GREEN
CONDO
GUIDE**





Alberta Green Condo Guide

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The Green Condo Guide for Alberta is based on work originated by the **Toronto Atmospheric Fund (TAF)** (www.toatmosphericfund.ca) and adapted for Alberta by the **Pembina Institute** (www.pembina.org).



PEMBINA
institute



Common objections to energy retrofits

“I may not be here long enough to see any payback.”

A good energy retrofit will help protect the capital you have invested in your condo by ensuring the building’s systems are in good operational order and operating costs are under control. A green building is comfortable and cost-efficient, which protects your investment and is more attractive to buyers.

“We can’t do anything to reduce utility costs because we can’t control what people do in their suites.”

Not true. In many condo buildings, in-suite electricity use represents less than 15% of the total building energy use. The condo corporation can do plenty to reduce the building’s energy consumption.

“Utility prices are going up so our savings will disappear.”

But in fact, the more utility prices rise the more you will save. Utility costs = consumption volumes X utility prices. We can’t control utility prices, but an energy retrofit can easily reduce consumption volumes.



Going green saves money and helps the environment

Reducing a building's energy bills is a huge opportunity to save money and reduce your building's impact on the environment.

At least a whopping 40% of your building's operating costs go to gas, electricity and water bills, making utilities the largest controllable expense for your condo corporation. Most older condos can cut these costs by 30% with upgrades such as more efficient lighting or boilers. Even newer buildings can realize savings of 15% or more. This guide outlines how to capitalize on energy saving opportunities in common areas of your condominium, including centralized heating, cooling and ventilation systems and lighting.

Following the steps will not only reduce your condo's energy use—saving money and reducing emissions—you'll have a more comfortable and well maintained building.



Get started



Baseline and benchmark

Start by understanding your existing energy use. Compare your building to buildings of a similar size, type and location by entering data about your building into the Energy Star Portfolio Manager (www.energystar.gov) to get your Energy Star score. Buildings up to three stories can also get an EnerGuide rating from a qualified energy auditor.



Audit

The next step is an energy audit with a qualified energy management firm. They'll assess your building and identify where you're using the most energy and the best opportunities for energy savings. Energy audits can include:

- Energy modeling with simulation software to calculate what energy efficient changes would look like to your building.
- Infrared cameras to show weaknesses in the thermal envelope of the building.
- Air tightness tests measure air leakage in townhouses and small apartment buildings. Air leakage is typically the primary source of energy loss and correcting it will make your building more efficient and comfortable.



Set goals

What do you want from the retrofit? Just reducing costs? Or do your stakeholders want more thermal comfort, better lighting and improved air quality? Retrofits can mean:

*5–10% energy savings through re-caulking windows, cleaning boilers and updating heating, ventilation and cooling set points.

*15–30% energy savings with installing new equipment or lighting systems.

*30–60% energy savings through ambitious measures such as building cladding, window upgrades, geothermal heating and cooling, and solar energy panels. Once you better understand your building and what your stakeholders want, you'll know which energy efficiency retrofit is for you.



Identify opportunities

Your energy audit will have uncovered specific areas in your building that could benefit from energy efficiency upgrades, whether it's replacing equipment with new high efficiency models or simply recalibrating controls or other minor modifications. Evaluate the benefits and costs of each opportunity to determine how they coincide with the goals you set with your stakeholders. Once you've figured out the energy efficiency measures you want in the retrofit, you can start developing a plan.

Audit

There can be big differences in energy audit services. Low cost or free audits may only look at one or two elements of the building and they're typically connected to some product or service the firm will recommend to you. A comprehensive audit will ensure that you don't miss any valuable energy conservation opportunities and that your decisions are based on the best possible information.

Here is the minimum service level you should look for in an energy audit:

- **Inspection and documentation of all of the buildings major mechanical and electrical systems, including:**

- Heating, ventilation and air conditioning
- Building automation system (BAS)
- Domestic hot water equipment
- Water conservation equipment (in both common and in-suite areas)
- Common Area Lighting
- Garage heating, ventilation, and lighting
- Laundry room appliances and equipment
- Building envelope (windows, doors, insulation, and air tightness)
- Inspection of a representative sample of suites to identify in-suite conservation opportunities

- **Energy and Utility analysis**

- Analysis of two or more years of historical utility data
- Summary and breakdown of buildings' energy use and costs by fuel source as well as end use (lighting, heating, etc)

- **Recommended energy conservation measures**

- A list of recommended energy conservation measures, including both operational changes and changes to mechanical/electrical equipment
- A list of optional upgrades that could be included as part of a retrofit plan
- A list of potential renewable energy deployments (solar photovoltaic, solar thermal, etc)
- Estimate of costs, savings, and payback and return on investment for each measure



Assess the business case

Energy efficiency pays for itself but taking a more holistic approach can get you a bigger bang for your retrofit buck. Look at your overall goals, energy audit results, various retrofit packages as well as blended payback and net present value (NPV). Consider how energy prices might go up and the repair and maintenance costs you may avoid by replacing old equipment with new high-efficiency models. Also consider other benefits of a retrofit, such as creating a more comfortable living environment—the primary purpose of a residential condominium—and preserving or enhancing property values.

Three ways to manage your energy retrofit project:

1

Design-build

This turn-key approach has the same firm design the retrofit, purchase the required equipment, select and manage sub-contractors and commission the project on completion.

2

Design-tender

An energy management firm designs your retrofit, bids it out to qualified contractors, helps you select the best contractor(s), supervises construction and commissions it on completion.

3

Do it yourself

You are your own general contractor and work with contractors you know and trust. This approach is only suitable for experienced building owners and operators who have the expertise and capacity, or for very simple energy retrofit projects.



Develop a retrofit plan

Think holistically

With goals and energy audit results in hand, you can consider your business case and other potential benefits. Is your building looking a bit tired? Consider retrofit measures that can also enhance its appearance such as lighting upgrades, new windows or an exterior insulation finishing system. If residents complain it's too hot or too cold, upgrade the heating control system. Look ahead to what capital replacements are due. If you need to replace your roof soon, plan for added insulation or a rooftop solar system.

Engage your stakeholders

Get your stakeholders on board with the plans as they evolve. Present a draft plan to the board of directors and then communicate with the owners and non-owning residents.

Make the plan







Decide what you're going to do and how you're going to do it. Determine whether it makes sense to do the retrofit in phases or all at once. Assess whether you need more detailed engineering studies. Decide whether to seek financing—remember that energy savings increase cash flow, which makes financing easier and can cover the repayment costs of a loan. Finally, determine your approach for project management and procurement.



Have a check list in place

- ✓ **Finance.** Secure any financing you require.
- ✓ **Contract.** Build your team of service providers and contractors.
- ✓ **Communicate.** Engage residents and explain the goals, benefits and timelines of the retrofit. Communication at the beginning of the process can diffuse tension over any noise or inconvenience caused by the retrofit. Residents can also play an important role in your energy savings by adopting energy conserving behaviours. So, let them know what they can do to help.
- ✓ **Install.** Get the retrofit started. Keep in touch with your contractors and engineers throughout the installation. New opportunities or challenges arise during the process and may require adjustments.
- ✓ **Commission.** Use a commissioning agent or quality assurance process to make sure that new equipment has been installed and works properly.
- ✓ **Train.** Make sure that whoever is in charge of your building's maintenance and operations knows how to use the new equipment and can troubleshoot basic issues before calling in the pros.
- ✓ **Take action.** Put your plan into action.

Optimize your investment

-  **Track your savings.** Assign someone to measure and verify your energy savings. Look at energy costs but also the amount of energy consumed, as prices vary over time. You can monitor energy use and savings in-house if you have trained staff or you can contract it out to an energy management firm. The free Energy Star Portfolio Manager software is one option for tracking your energy performance and it will compare your building to others of a similar size, type and location.
-  **Protect your savings.** If there's an issue with your new equipment or it's not performing well, have your management firm or contractor troubleshoot any problems.
-  **Maintain your savings.** Ensure your new equipment is maintained and operated correctly. This is why it's important to train your staff. Check into manufacturer recommendations to protect your warranty.
-  **Enhance your savings.** Periodic re-commissioning can help maintain or even increase your savings over time. You can always benefit from continued energy audits or find new opportunities for efficiency.
-  **Communicate your success.** Update your stakeholders, residents and tenants regularly about how the retrofit is performing, both financially and environmentally. This will build momentum for future projects and keep residents and tenants engaged in ensuring the building stays energy efficient.
-  **Repeat for additional upgrades + technologies.** Keep on top of your building's performance and opportunities to increase efficiency with upgrades or new technology.

Case studies

The following case studies come from work completed by the original Green Condo Guide team in Toronto. Energy efficiency opportunities translate relatively well from one region to another across Canada. Hopefully future guides will include examples from projects completed in Alberta.

15 Kensington Road, Brampton, Ontario

There was a lot to do at 15 Kensington Road in 2005. The building's managers identified a lot of opportunities for improved energy efficiency, from replacing the boilers and toilets to integrating the air handling unit with the boiler and chiller systems. By staging the retrofit in such a way that utility savings actually paid for the cost of later improvements, they were able to reduce their natural gas use by 28% and cut the chiller's electricity demand in half while reducing the building's greenhouse gas emissions by more than 300 tonnes a year.

Energy Efficiency Measures

Results

High-efficiency boilers	✓	\$677,720	Project cost
High-efficiency air-handling unit with variable frequency drives	✓	4.4 years	Payback period
Low-flow toilets	✓	\$65,000	Annual energy cost savings
High-efficiency chiller	✓	300 tonnes	Reduced annual GHG emissions



2 Aberfoyle Crescent, Toronto, Ontario

Despite being a relatively new building, the condo board discovered that 2 Aberfoyle had many opportunities to improve energy performance. The board undertook an ambitious three-year energy retrofit plan, which included adding new high-efficiency condensing boilers, as well as the use of carbon monoxide monitors and a variable speed drive to improve the ventilation system's efficiency. While the project did face a number of challenges, this retrofit shows that even relatively new buildings can improve their energy efficiency to save money and reduce carbon emissions.

Energy Efficiency Measures

Results

T8 lighting and electronic ballasts	✓	\$145,635	Project cost
Carbon monoxide sensors in the parking garage	✓	2.3 years	Payback period
High-efficiency condensing boilers	✓		
Variable frequency driver for make-up air unit	✓	164 tonnes	Reduced annual GHG emissions

Energy efficiency



Condensing boilers can be more than 90% efficient (90% of the energy in the gas burned becomes useful heat) compared to the **60%** (or less) operating efficiency of old atmospheric boilers.



Variable speed drives can cut the energy used by fans and motors by **40%** or more.



New LED fixtures can cut power for lighting by **50%** or more.



LED lighting and adaptive controls can cut the energy used by parking garage lights by as much as **70%**.



Low-e coated argon-gas filled windows can cut your heating costs by **25%** or more (that's without factoring in better sealing around new windows).



6 litre toilets can cut water consumption by more than **50%**



7 facts + figures:

Installing a high efficiency boiler

instead of a new conventional boiler can pay for itself in less than 5 years.



Installing heat reflectors

can trim your heating costs by up to 10%, especially in older buildings, and will often pay for themselves within 3 years.



New high efficiency chillers

use **50%** less power than those installed 30 years ago.



Moving to a high-efficiency chiller

that is a little smaller could save a **140,000** square foot building **\$12,000** a year.



Fixing energy leaks

—uninsulated or leaking pipes, leaky seals around windows, drafts and cold spots, inefficient showerheads—will reduce utility and maintenance costs.



For more information about greening your condo visit:
TowerWise www.TowerWise.ca or contact
the Alberta Energy Efficiency Alliance www.aeea.ca

