



Healthy Homes Calgary

Energy

The Union of Concerned Scientists ranks housing third among destructive human activities, just behind transportation and agriculture. In Canada, 17% of all energy goes to running our homes and, here in Calgary, 30% of the Ecological Footprint is from household electrical consumption. Furthermore, the average household in Calgary is using 8% more energy today than it did in 2005.

Alberta's energy mix is inherently unsustainable. Your electricity is generated from a mix of non-renewable fossil fuels - 62% coal, 31% natural gas; the other 7% is generated from a mix of hydro, wind and other mixed sources. Home space and water heating is largely done with natural gas. Alberta's energy mix contributes to climate change and drastic modifications to previously pristine natural areas. Although you cannot stop using energy altogether, there are many ways that you can make the most of the energy you need to run your home.

Home Energy Use

According to a 2005 residential energy study, home energy (natural gas and electricity) is used in 5 ways:

- 66% Space Heating
- 20% Water Heating
- 10% Appliances
- 4% Lighting
- <1% Space Cooling

The following section will assist you in assessing the operating costs and energy efficiency of your home. Above average energy efficiency will reduce month to month operating expenses of your home with the additional benefits of improving comfort, indoor air quality, conserving Alberta's natural resources, and reducing environmental impact.

Ventilation & Energy Efficiency

Indoor air quality and ventilation are intricately connected. Ventilation is the capacity to bring fresh air into the house and expel stale air. A leaky house will have good air exchange, expelling moisture and stale air to ensure good indoor air quality and avoid mould growth, but it will result in high heating bills. It is essential to balance the building tightness with properly functioning ventilation systems. Modern day homes mechanically circulate air through the homes HVAC (heating, ventilation and air conditioning) system. Minimizing indoor toxins, while maintaining the HVAC components will keep your home comfortable and healthy, while maximizing the use of expensive utilities.

Fact

Plasma televisions consume as much as five times the electricity of the old-style cathode-ray tube models. Many plasma TVs are bigger than their predecessors, meaning they consume even more electricity than the sets they replace.

Determining Your Household Energy Use

Have a look at your utility bills. These provide a history of your energy use. It is beneficial to collect bills from the previous 12 months to determine electricity use (kilowatts) and natural gas usage (gigajoules).

- Electricity Usage: how many kilowatt hours (kWh) are used each year?
- Natural Gas: how many gigajoules (GJ) are used each month?

Average? Below Average? Above Average?

Once you have ascertained this information, compare it to the averages in the tables below to see how your home's energy use compares to the Alberta average. If your home is smaller or larger than average, you can expect to see corresponding variances in the energy and electricity consumed.

Housing Type	Annual Electricity Use (kWh)	Annual Natural Gas Use (GJ)
Single Detached*	7,453	140
Single Attached**	4,720	89
Apartment***	3,583	67
Mobile Home****	7,013	132

* Based on 1,444 sq ft or 134 sq m (average single detached home in AB)

** Based on 1,209 sq ft or 112 sq m (average single attached home in AB)

*** Based on 919 sq ft or 85 sq m (average apartment in AB)

**** Based on 1,062 sq ft or 99 sq m (average mobile home in AB)

Seasonal Natural Gas Consumption

Natural gas consumption varies according to the season. The average Alberta home will use 135 GJ of natural gas per year broken down monthly as follows:

January	23 GJ	May	5 GJ	September	5 GJ
February	18 GJ	June	3 GJ	October	9 GJ
March	16 GJ	July	3 GJ	November	18 GJ
April	9 GJ	August	4 GJ	December	22 GJ

The Checklist

Question	Comment	Positive Action
Do you use a programmable thermostat?	For every 1 degree Celsius lower the house temperature is for a minimum of 8 hours, you can expect to save 2% on your heating bill. They automatically adjust your home's temperature when no one is at home or when you sleep.	<input type="checkbox"/> Install and set a programmable thermostat a few degrees lower during the night and when the house is empty and a programmable thermostat will have paid for itself in a few short months.
Have you switched to compact fluorescent lighting (CFLs)?	The average Canadian home has 30 light fixtures, indoors and out, that consume close to \$200 of electricity every year. Replacing just five bulbs with ENERGY STAR qualified CFLs in high-use areas can save up to \$30 a year, depending on location and amount of time used. That means you'll pay off the added cost of the bulbs in less than two years, and they last for at least five.	<input type="checkbox"/> Replace old incandescent bulbs with CFLs. <input type="checkbox"/> Recycle burnt out bulbs at Ikea, Home Depot and Rona stores throughout Calgary.

Have you considered motion sensors?	Motion sensors give you light when it is needed. Instead of leaving porch or yard lights on for hours, you could install a motion sensor.	<input type="checkbox"/> Evaluate potential locations for motion sensors. In most cases these installations are ideal for do-it-yourselfers; rarely is an electrician required.
Is your weather stripping in good shape?	The majority of energy used in a home is for heating. By making sure your windows and doors are properly sealed you'll see instant savings by decreasing energy use and your home will be less drafty and quieter.	<input type="checkbox"/> Inspect window and door seals, replacing those that are cracked or worn out. <input type="checkbox"/> Visit http://oee.mcan.gc.ca/residential/personal/air-leakage-control.cfm?attr=4 to learn about finding home leaks.
Have you replaced your furnace filter in the last three months?	A clean furnace filter means better air quality and better furnace efficiency. Replacing your furnace filter on a regular basis is a sensible investment.	<input type="checkbox"/> Replace your furnace filter every 2 to 3 months. Look for filters that filter out allergens and other air pollutants.
What is the temperature of your hot water tank/heater?	For every 10 ^o F (~6 ^o C) reductions in water temperature, you can save between 3% to 5% in energy costs. Some manufactures pre-set their water heaters to 140 ^o F (60 ^o C) but most households only require them set at 120 ^o F (49 ^o C).	<input type="checkbox"/> Check the temperature of your water heater and lower it if necessary. <input type="checkbox"/> Install a water heater blanket/jacket. These low-cost insulators (\$35) stop 97% or radiant heat loss. These can save hundreds of dollars over the life of the water heater, especially if your water heater is old enough that it has fiberglass insulation instead of foam.
Is your attic and/or crawlspace insulated?	In an average home, 15% of heat escapes through basement walls.	<input type="checkbox"/> If there is no insulation in the basement you should consider making this home improvement.
Are any of the air vents in your house obstructed?	Blocked air vents can make a room cool, while causing the furnace to work harder.	<input type="checkbox"/> Inspect your home to make sure air vents aren't being blocked. This will improve air circulation and heating.
Are your heating ducts properly sealed?	Homes with a duct heating/cooling system can lose up to 20 percent of the air moving through the duct system due to leaks and poorly sealed connections.	<input type="checkbox"/> Since ducts are often concealed in walls, ceilings, attics, and basements, sealing them can be difficult. Do-it-yourselfers can start with ducts that can be accessed (such as those in attics, crawlspaces, unfinished basements, and garages). Seal leaks with mastic sealant or metal tape, not duct tape, as it is not long-lasting. Also, make sure that connections at vents and registers are well-sealed where they meet the floors, walls, and ceiling. These are common locations to find leaks and disconnected ductwork.
If you have an air conditioner, does it sit in the sun?	Air conditioners that are in direct sunlight must work considerable harder than those that are shaded. This increases energy use and wear and tear on the unit.	<input type="checkbox"/> Plant shade trees or shrubs to take the heat off your air conditioner.

Do you have a fireplace?	When fireplaces are not in use, large amounts of heat can escape out the chimney, costing you and the planet.	<input type="checkbox"/> Put a damper in the chimney to prevent cold air from entering the house when the fireplace is not in use.
Do you have ceiling fans in the home?	Ceiling fans cool the home in the summer, while using a fraction of the energy that an air conditioner uses. In winter, ceiling fans move warm air down, drawing cool air up, making rooms feel warmer.	<input type="checkbox"/> In winter, set fans in a clockwise position to move warm air down. <input type="checkbox"/> In summer, set fans in a counter-clockwise position to create a cooling effect. <input type="checkbox"/> Install ceiling fans to cool the home in the summer or move warm air down in the winter.

R-Values

This is the measure of the resistance to heat flow of a given thickness of a material. The greater the number, the better the resistance.

A Note on Wall Insulation

Here is a guideline based on the age of the home:

- If the home was built in 1990 or afterwards, the insulation is likely 2X6 (stud size), R20.
- If the home was built between 1975 and 1990, the insulation is likely 2X4 (stud size), R12.
- If the home was built between 1965 and 1975, the insulation is likely 2X4 (stud size), R8.
- If the home was built before 1965 the insulation could be anything. A home of this age requires further investigation.

Other Considerations

Consider solar outdoor lights for long driveways and dark yards. They soak up energy from the sun during the day and provide the illumination you need at night--off the grid and off your energy bill. Even shady areas can be lit if the sunlight-collecting cell is placed in a bright spot. Both the LED bulbs and the solar-powered batteries last for years.

Use landscaping to help with home heating and cooling costs – deciduous trees (Schubert Choke Cherry and Swedish Columnar Aspen) on the South side of the home will block the sun in the summer, keeping the house cool, while coniferous (evergreen – Colorado Blue Spruce or Scot’s and Mountain Pine) trees act as an excellent wind block.

Consider downsizing your appliances when replacing them. Are there things that you store in the fridge that don’t need refrigeration? (i.e. peanut butter, soy sauce, et cetera). Do you have a beer fridge that you could do without?

Energy Efficient Renovations

The recommendations made in the checklist can make a significant difference to one’s energy use but if you are looking to make large home energy efficiency improvements, you should consider having a home energy audit conducted. After completing a home energy audit, residents may receive a government grant (up to \$4300) for making energy efficient home improvements. If you are considering upgrading your heating system; increasing insulation; or putting in a new water heater it is worth your while having an audit done.

A list of government-approved energy auditors is located below.

- AmeriSpec of Canada – 1866-284-6010
- ATCO EnergySense (www.Atcoenergysense.com) – 310-7283 (Toll Free)
- Ecofinity Canada Inc – 1-866-935-3777
- VerdaTech Energy Management & Consulting – 1866-241-6804 (Toll Free) or 403-251-0683 (in Calgary)

Please note that the cost of an energy assessment varies among the service providers and is subject to change. To give you an idea of price of an evaluation and follow-up visit (to verify upgrades), a cost survey conducted in 2008 found that initial assessments range from \$250 plus GST to \$275 plus GST, with follow up visits ranging from \$99 plus GST to \$150 plus GST.

Rebate for Albertans

Albertans who complete a home energy audit are eligible for a rebate of up to \$200 - \$100 for the initial audit and \$100 for the follow up audit. To learn about this rebate, and others, please visit: http://www.climatechangecentral.com/my-rebates/home_evaluation

Alternative Energy

Sedmek (<http://www.sedmek.com/>): a Calgary, Alberta based renewable energy services company, specializing in residential and commercial systems.

Goosecreek (<http://www.goosecreek.ca/>): a family owned and operated business that provides and installs Hybrid Renewable Energy Systems for electricity. This includes, but is not limited to, Wind Generation and Solar Power to remote livestock watering wells or dugouts, telecom communication towers, and rural or urban residences.

React Energy (<http://www.reactenergy.ca/>): a Calgary based geo-thermal Company.

Thermal Creek (<http://www.thermalcreek.com/main.html>): a Calgary based geo-thermal Company.

What About “Green” Power?

Bullfrog Power is now operating in Alberta, offering 100% made in Alberta wind power. Although green power costs a bit more (approximately \$0.50 more per day or \$15 per month), taking a few energy efficient measures around your home will help to offset the additional cost. By switching to a cleaner source of electricity, you are making a bold and important statement: you are saying that you support renewable energy sources over those that are non-renewable and unsustainable. Visit www.bullfrogpower.com or call 1.877.360.3464 for more information.

Additional Resources

Climate Change Central (www.climatechangecentral.com): a Calgary-based organization working to reduce greenhouse gas emissions. CCCs work includes policy, energy efficiency, technology development and environmental communications.

Consumers Guide to Home Energy Savings (9th ed): Written by Jennifer Thorne Amann, Alex Wilson and Katie Ackerly, this comprehensive book focuses on saving energy in the home. It's informative and easy to use. It's available at Clean Calgary's EcoStore (www.cleancalgary.org) or through New Society Publishers (www.newsociety.com).

Lehman's Non-Electric Catalogue (www.Lehmans.com): this amazing catalogue is a complete listing of non-electric household appliances and housewares, toys, yard and garden tools, and more. Flipping through a Lehman's catalogue is like taking a trip back through time.

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