

Environmental Education: **Climate Action**

Become an Energy Detective!

Background Information

Building energy use is one of the region's greatest source of community greenhouse gas (GHG) emissions. Approximately 35% of GHGs come from buildings, such as homes and school. The majority of these emissions can be attributed to the burning of fuels like natural gas and oil to provide heating and hot water.

Much of our building energy use could be unintentional and unnoticed such as heat leaking from windows, using more hot water than necessary, appliances or electronics drawing energy when not in use. Tracking down all the things in our buildings or homes that use energy can help guide ways to reduce energy consumption and GHG emissions. Become an energy detective and track down all the places you use energy at home.

Warm-Up

Without looking at the activity to follow, brainstorm all the things in your house that you think use energy. Write ideas down on a piece of paper or discuss verbally. Once you complete your energy detective activity compare how many things in your house use energy to what you originally thought.

Activity Instructions

Follow clues and gather evidence to find the energy users in your house.

Energy is used to “do work.” In our homes that work could be to create light, cook, heat or cool, create sound or video. The first step to reducing or changing our energy use is to find where and how we use energy in the first place. Use the one or both of the provided Evidence Logs to record your observations and help guide ideas and discussions about how to reduce home energy use.

Check with an adult before starting as their assistance may be required for some evidence gathering.

Expand and Connect

- Pick something to adjust or change at home to reduce household energy use.
- After you trial some changes, with your parent's help, use BC Hydro's "My Hydro" consumption data to track electric energy use. This dashboard will show trends in electricity use for your home yearly, monthly, daily and hourly. For example if you made sure to unplug all appliances and electronics not in use for a day or week can you see the results on the hydro account?
- Continue your quest to reduce your climate impact and complete some of our active travel activities to learn about ways to reduce are biggest contributor of GHGs — transportation.
- Waste is the region's third largest contributor of GHGs. Complete activities and learn about waste and the 3Rs (reduce, reuse, recycle).
- Borrow a [Climate Action To-Go Kit](#) from your local library and use the tools provided to discover air leaks in walls and around windows, measure your home's optimal lighting or check appliance electricity use.

For more information about climate action in the region visit www.crd.bc.ca/climate.

Evidence Log — Home Energy Users

Most emissions from buildings result from using natural gas and oil to provide heating and hot water. Factors that affect energy use include building age, size and type of use. Depending on where you live and the design of your home you may have different answers. In general things that use hot water (showers, faucets, washing machines, dishwashers) have a higher GHG impact. If your home has single pane or drafty windows that let heat in and out, forcing you to have the heat or air conditioning on more often then this may be a large contributor. Old appliances also use significantly more energy then newer high efficient appliances.

Inspect every room of your house looking for energy users. Use the evidence log chart provided, create your own or use the charts within the instructions to record your findings.

Crime Scene

What type of home do you live in? Detached house Townhome Apartment/Condo

How many people live in your house? _____

What type of fuel does your house use? Electric Natural Gas Oil Other (propane, wood, coal)

How many outlets (plugs) does your house have? _____

How many outlets have things plugged in right now? _____

Suspect #1: Large Appliances

Large appliances such as refrigerators, stoves, and washing machines can use a lot of energy. Over the past few decades many energy efficient appliances have been designed to replace older less efficient appliances. Between 1990 and 2013, dishwasher became 3 times more efficient, refrigerators used 56% less energy and clothes washers use 72% less.

How many large appliances do you have in your home?

Are they energy efficient models? *Hint: look for the ENERGY STAR® logo or sticker.*



Large Appliances	Number in house	Energy Efficient?	Notes
Refrigerator			
Oven			
Stove			
Freezer			
Dishwasher			
Washing Machine			
Clothes Dryer			
Other:			

Suspect #2: Small Appliances

While appliances and electronics are becoming more efficient, we are purchasing and using more. Using small appliances, when possible, in place of large appliances will reduce home energy consumption. For example, if you are cooking a small meal consider using the toaster oven instead of the full-sized oven.

Small Appliances	Number in house	Energy Efficient?	Notes
Toaster			
Toaster Oven			
Coffee Maker			
Microwave			
Kettle			
Fan			
Space Heater			
Vacuum cleaner			
Hair appliances (blow dryer, straightener)			
Other:			
Other:			

Suspect #3: Electronics

Natural Resources Canada estimates we own 160% more electronics than 10 years ago. Some electronics and charging systems will draw power even when off. This use of power while off is called standby, phantom or vampire power.

Electronics	Number in house	Energy Efficient?	Notes
Smart phone			
Tablet			
Laptop			
Desktop computer			
Speaker			
Video game console (e.g. Xbox, PlayStation)			
Television			
Internet router/modem			
Other:			
Other:			

Suspect #4: Lighting, Heating and Cooling

The introduction of compact fluorescent lights (CFLs) and light-emitting diode (LED)lights has greatly reduced the energy needed to light homes. CFL and LED bulbs are 75 to 80 percent more efficient and have a much longer life than incandescent bulbs.

Lighting, Heating and Cooling	Number in house	Energy Efficient?	Notes
Ceiling lights			
Lamps			
Windows			
Curtains or Blinds			
Programmable or Smart Thermostat			
Other:			
Other:			

Suspect #5: Hot Water

Approximately 19% of home energy use is for heating water. Adjusting how much hot water we use or avoiding hot water when possible will have an impact on home energy use.

If looking to buy water efficient fixtures look for the WaterSense logo on the packaging.



Hot Water	Number in house	Energy Efficient?	Notes
Showers			
Low flow shower heads			
Average shower time			
Faucets (taps)			
Faucets with aerators			
Dishwasher loads per week			
Laundry loads with hot water per week			
Other:			
Other:			

Evidence Log — Home Energy Users

	Kitchen	Living Room	Dining Room	Bathrooms	Bedrooms	Other (rec. room, basement, garage)	Total
Large Appliances							
Refrigerator							
Oven							
Stove							
Freezer							
Dishwasher							
Washing Machine							
Clothes Dryer							
Other:							
Small Appliances							
Toaster							
Toaster Oven							
Coffee Maker							
Kettle							
Fan							
Space Heater							
Vacuum cleaner							
Hair appliances (blow dryer, straightener)							
Microwave							
Other:							
Electronics							
Smart phone							
Tablet							
Laptop							

	Kitchen	Living Room	Dining Room	Bathrooms	Bedrooms	Other (rec. room, basement, garage)	Total
Desktop computer							
Speakers							
Video game console (Xbox, PlayStation)							
Television							
Internet router/mo- dem							
Other:							
Lighting							
Ceiling lights							
Lamps							
LED Bulbs							
CFL bulbs							
Incandescent bulbs							
Heating and Cooling							
Windows							
Blinds or curtains							
Windows that open							
Programmable or Smart thermostat							
Hot Water							
Showers/bathtubs							
Low flow showerheads							
Average shower time							
Faucets (taps)							
Faucet Aerators							

Discussion

1. Which energy users do you think have the largest impact on home GHG emissions?
2. If cost was not an issue, what are some things (behaviours, renovations, purchases) that could be changed at home to reduce energy consumption?
3. Use the [energy vampire calculator](#) to estimate the power consumed and potential costs of appliances and electronics using standby power in your home.
Standby power, sometimes referred to as vampire or phantom power is when devices such as TVs, computers, or video game consoles draw power even when they appear to be off. Appliances and electronics are designed this way so that the constant supply of power allows them to turn on quickly.

Resources

Capital Regional District
[Climate Action Initiative](#)
[Climate Action At Home](#)

Natural Resources Canada
[Energy Use Statistics](#)
[Energy Efficiency Trends in Canada 1990-2013](#)
[What is an energy-efficient home?](#)

BC Hydro
[Tools and calculators](#)
[21 Tips to Save Energy](#)
[My Hydro](#)

Online Calculators
BC Hydro's [cost calculator](#) for appliance energy use.
Hydro Quebec's [Electricity Used for Lighting Calculator](#)
Duke Energy's [Energy Vampire Calculator](#)
Global Footprint Network's [Ecological Footprint Calculator](#)

Videos
Speed drawing animations explaining science for kids by the25sda.
[What is energy](#)
[How To Save Energy](#)

If you have any questions about climate action in the region, or are looking for ideas on how to connect this topic with other learning opportunities, please contact us at education@crd.bc.ca.