ENERGY EFFICIENCY AT HOME PRESENTATION

TEACHER'S NOTES

Slide 1 | Energy Efficiency at Home

Slide 2 | Overview

What is Generation E?

What is energy efficiency?

Ways to make a home more efficient

The student-led home energy review activity

Slide 3 | What's Efficiency Manitoba?

Have you heard about Efficiency Manitoba?

Efficiency Manitoba is an organization dedicated to helping Manitobans save energy, money, and the environment.

Efficiency Manitoba is Manitoba's newest Crown corporation, launched in April 2020.

Efficiency Manitoba offers programs and rebates for Manitoba homes, businesses, and communities to reduce their energy use.

Slide 4 | What's Generation E?

Generation E is an initiative by Efficiency Manitoba to empower you, the next generation of energy savers.

The goal is to teach young people like you the importance of energy efficiency and protecting the environment, and to ensure you are aware of how using energy has financial and environmental impacts. This will help you make energy-efficient decisions throughout your adult life.

What does the E stand for? It stands for a few things: energy, efficiency, environment, and education. These four words encapsulate the foundation upon which this initiative is built.

Slide 5 | Energy & energy efficiency

I'll briefly talk about energy and get into energy efficiency.

Slide 6 | What do we need energy for?

We need energy for so many things in our lives.

- Heating and cooling our homes
- Lighting
- Powering appliances & electronics
- Food production
- Manufacturing

Can you think of anything else?

Energy is a necessary component of human life and comes in many different forms.

Slide 7 | Where does energy come from?

In Manitoba, approximately 97% of our electricity comes from renewable hydropower. We use the potential energy of rivers to generate electricity, which is stored and transported to our homes, schools, and offices.

Source: https://efficiencymb.ca/articles/how-the-average-manitoba-home-uses-energy/

The province's remaining electricity needs are fulfilled by:

- 1 thermal generating station
- 4 remote diesel generating stations
- Wind power purchases from independent wind farms in Manitoba.

https://www.hydro.mb.ca/corporate/facilities/

In southern Manitoba (including Winnipeg), many homes and businesses use natural gas for both space and water heating.

Slide 8 | What is energy efficiency?

- Using less energy to do the same job.
- Using energy to its maximum potential.

Being energy efficient doesn't mean doing less things that require energy, although that is a great way to start. Energy efficiency means using less energy to do the same job. A lot of the activities we do every day waste energy. So essentially, when we are using something that is energy-efficient, we are wasting less energy.

We want to make sure energy is used to its maximum potential. When we do this, we not only save money, but we also reduce our negative impact on the planet (in the case of burning fossil fuels like natural gas).

Slide 9 | What is efficiency?

$$\text{Efficiency} = \frac{\text{output}}{\text{input}} \times 100$$

Efficiency is the ability to get something done with as little waste as possible. This can be wasted energy, effort, money, time, or whatever else.

We can calculate efficiency by comparing the output of energy to the input of energy. We do this by dividing the output by the input and multiplying by 100 to get a percentage.

The more efficient something is, the higher the final number will be.

Slide 10 | Why energy efficiency?

Save energy: Energy efficiency saves energy, as we discovered in the previous slide.

Saves money: Using energy costs money, so the less energy we use the more money we save. Less money on energy means more money available for other things.

Even though hydropower is a relatively sustainable electricity source, building new dams is expensive! So it's important to save electricity wherever we can.

Save the environment: Using natural gas efficiently is especially important for reducing harmful greenhouse gas (GHG) emissions and protecting the planet.

Burning fossil fuels causes greenhouse gas emissions, which contributes to global warming/climate change. And climate change leads to lots of negative effects on all of us, including extreme weather events like wildfires and melting ice caps.

Therefore, using less energy means we are making a difference for the environment. Improving our energy efficiency can improve the health of our environment. Fewer emissions, less harm to natural environments, and less extraction of fossil fuels from the ground are all good things for the planet.

Countries around the world will suffer the consequences of climate change. It's impacting Manitoba too, with extreme weather like heat waves, flooding, and droughts becoming more and more common across the province. In northern Manitoba, ice is melting earlier and freezing later in the season. This has destroyed polar bears habitats and has made it harder for them to find food. We can all work together to improve the health of our planet – and energy efficiency is a great way to make a difference for the environment.

Slide 11 | What can make a home more energy efficient?

Adding insulation: It's like adding layers to your home. When it's cold we wear jackets as insulation, so it's the same principle for your home.

Using high-efficiency heating systems: High-efficiency heating systems are way more efficient than the standard heating systems.

Installing LED lighting: LEDs last up to 25 years and use 80% less electricity than traditional incandescent bulbs. Every LED your house installs can save up to $4 per year. Think of how many bulbs you have in your home and how much you could save!

LED lights are more efficient because they convert much more of the electricity into light. Older types of light produce mostly heat along with some light. (more on slide 17)

Using ENERGY STAR® certified appliances and electronics: If you are going to buy electronics and appliances, it's beneficial to look for the ENERGY STAR® logo, as those products use less energy.

ENERGY STAR® is an internationally recognized program that identifies the most efficient products available for purchase. If you notice that an appliance has a blue ENERGY STAR® label, you can be confident that it's in the top 10% to 30% of its class in energy performance.

Note for teachers:

"ENERGY STAR Canada is a voluntary partnership between the Government of Canada and industry to make high efficiency products readily available and visible to Canadians."

https://natural-resources.canada.ca/energy-efficiency/energy-star-canada/about/22177

*"**Energy Star** (trademarked ENERGY STAR) is a program run by the U.S. Environmental Protection Agency (EPA) and U.S. Department of Energy (DOE).*

Slide 12 | Energy use in Manitoba homes

We all need electricity to power things like our lights, electronics, and appliances. But this accounts for only about 20% of energy use in Manitoba homes. The other 80% comes from heating and cooling our homes, and heating water. In fact, 60% of Manitoba homes use natural gas for their main heating source. Natural gas is a fossil fuel. We don't produce our own natural gas in Manitoba – we import most of it from Alberta.

People can also power their homes and businesses with solar energy, which converts energy from the sun into electricity.

Source: https://efficiencymb.ca/articles/how-the-average-manitoba-home-uses-energy/

Slide 13 | What affects your home's energy consumption?

Age of your home: Older homes tend to have less insulation and other energy-efficient features than newer homes.

Number of people in your household: More household members means more energy consumers.

Square footage of your home: Larger homes tend to use more energy.

Individual behaviours: Your thermostat settings, hobbies, and habits can all impact energy use.

Slide 14 | Furnace & water heating systems

Space heating systems are usually fueled by natural gas or electricity in Manitoba.

Natural gas can power boilers and standard, mid, or high-efficiency furnaces.

Electricity can power furnaces, boilers, and baseboard heat.

There are other heating systems, including wood stove, air source heat pumps, and ground source heat pump (geothermal).

The home energy review activity has descriptions of the different types of heating systems. I'll be explaining the activity later, but I encourage you to do an internet search on the different space heating systems, to see which one you have. There are plenty of pictures of the different types on the internet.

Slide 15 | Age of home & energy efficiency

There are codes that say how homes should be built. Before 1999, those codes required less insulation than is required now. Adding more insulation to the attic, walls, and foundation not only saves energy but also improves comfort.

Slide 16 | Adjusting your thermostat

You can save heat by turning back your thermostat by a couple degrees at night or when you're away from home. In the summer, increase the temperature by 3°C or more for at least 8 hours a day to save up to 4% on cooling costs (opposite for winter). Temperature adjustments are easy with programmable and smart thermostats.

Slide 17 | Light bulbs

One easy change you can make is turning lights off when you leave a room. You can also consider upgrading to LEDs, which stands for light-emitting diodes. These are the most efficient type of light bulb. They're cool to the touch and last up to 25 years — that's 25 times longer than incandescent bulbs! Incandescent bulbs are the oldest type of light bulb. They have a filament, are hot to the touch, and are inefficient.

Plus, LEDs use 80% less electricity than incandescent. This means for every LED you install at your house, you can save up to $4 per year. Think of how many bulbs you have in your home and how much you could save!

Besides LEDs and incandescent lightbulbs, there are other types, including:

- Halogen, which is an incandescent, but more efficient. It has a tubular or compact shape and is very bright and very hot to the touch.
- CFL (compact fluorescent lighting) are efficient and often seen in a spiral design. They last eight times longer than incandescent bulbs.

Slide 18 | Water savings

You can use flow bags to check how much water flows out of faucets and showerheads.

Energy-efficient showerheads usually have a flow rate of around 5.7 litres per minute (1.5 gallons per minute).

By saving hot water, you save on energy used to heat the water – this is an energy efficient choice!

Slide 19 | Phantom power

17% of the average Manitoba household's energy bill goes towards powering appliances and electronics.

Some electronics and small appliances even use energy when they go into standby mode. We call this phantom power.

If you have a lot of electronics (like gaming systems), unplug them when they're not being used or use a power strip with a timer or automatic shut-off, or you can turn off the power strip yourself.

Slide 20 | Benefits of high-performance windows

- Windows can be single pane, dual pane, or triple pane.
- Triple pane windows are the best for energy efficiency.
- Find out how many panes a window has using a flashlight.

  Take a flashlight (or the flashlight on a smartphone) and shine it directly at one of your windows. You'll see either one, two, or three spots of light appear on the glass. The more panes of glass a window has, the better its insulating properties.

  - If you see ONE spot of light, your window has ONE pane of glass.
  - If you see TWO spots of light, your window has TWO panes of glass.
  - If you see THREE spots of light, your window has THREE panes of glass.

Slide 21 | Easy energy-saving tips

It's no secret that electronics use a lot of electricity! By taking some simple steps, you can reduce the amount of energy they use.

An obvious, simple, yet often overlooked energy-saving technique is to make sure to power off all electronics when not in use. As mentioned earlier, even powered off electronics can still have an internal clock running that draws electricity. If devices are plugged into a power strip, you can simply turn the power bar off. When electronics aren't in use, putting them on sleep mode will decrease the amount of electricity they're using.

You can use smart power strips. They automatically power down connected devices (e.g. printers, monitors) when the main device and primary energy consumer (e.g. PC) has gone into energy-saving mode.

If you take shorter showers, you will save on hot water which will save on energy. When washing your hands, you use warm water for proper hygiene; make sure the taps are fully off when you're finished.

Lighting controls, like dimmers, are another energy-saving measure. Sometimes we don't need full brightness! Dimmers help you decide how much energy you want your lights to use, or to use just what you need. The less time your lights are on, the less electricity you use. You have the power to help control the energy consumption of the lights around you by ensuring lights are turned off when they're not being used. Is the whole class out for lunch, including the teacher? Turn off the lights! While it's a small action, multiple smaller actions make big changes and form a routine to save energy in other areas of your life beyond school.

Windows and doors shouldn't be left open when the heating and cooling systems are being used. The warm or cool air will escape, meaning the system has to work harder and use more energy. Also, avoid using space heaters when the AC is being used. Using heating and cooling systems at the same time can be a big energy waster.

Other ideas:

- Only run full loads of dishes and laundry
- Use natural sunlight: Take advantage of the sun's natural power. It gives us light, heat, vitamins, and mental health boosts, and it's all for free!
- Reduce waste: Reducing waste is important from an environmental standpoint, but also for other reasons. Producing a product takes materials and energy, and no matter what they are (electronics, paper, water, food, or packaging), there is an abundance of trash ending up in our streets, parks, rivers, and oceans. Finding a way to reduce waste will help clean up the natural environment and save on energy.
- Close your drapes or drop your window shades during sunny days.
- Wash your clothes in cold water and only with a full load of laundry.
- Turn down your heat or air conditioning when you aren't at home or at night when sleeping.
- Hang your laundry outside to dry instead of using your clothes dryer.

Slide 22 | Next steps

The student-led home energy review is an activity designed to lead you through your home and conduct a 20 to 30 minute home audit.

Through an online form, you'll respond to questions that will ask you to evaluate different energy-using products and technologies in your home.

When you complete the review, if agreed to, your parents or guardian will receive a customized report that identifies Efficiency Manitoba programs and rebates that will help them improve the efficiency of your home.

You will also receive an email with tips on how to make simple energy-saving changes in your day-to-day life.

There is also the option to do it on paper. *(teachers you can request the paper copy by emailing hello@generation-e.ca to give to your students).*

The online form will ask you some personal information:

- Your name & email (the email is optional so that Efficiency Manitoba can email some general energy savings tips
- Your parent's/guardian's name & email (optional) (so Efficiency Manitoba can email suggestions on rebates and programs they might be eligible for, which could help them save money! They will only send them one email and that's it.)

- City/town (so Efficiency Manitoba can keep track of where students are from so they get students from across Manitoba to participate)

You'll be asked to answer questions about the following attributes of your home:

- Space heating
- Water use (flow bag test)
- Type of light bulbs & how many of each
- How many electronic devices you have
- Windows
- Doors

You'll need:

- A coat hanger
- A tissue
- A clip to attach the tissue to your coat hanger
  - Paper clip, hair clip, clothespin, etc.
- The flow bag from your kit
- A flashlight or a phone with a flashlight

Is this something you are excited about doing? What do you think about the Home Energy Review kits that you received?