



# ENERGYWISE GUIDEBOOK

## for Organizations

---

# ENERGYWISE GUIDEBOOK

## for Organizations

### TABLE OF CONTENTS

<b>1</b>	<b>Introduction</b>
<b>1</b>	<b>What is Energy Efficiency?</b>
<b>2</b>	<b>Building Energy Use</b>
<b>2</b>	<b>Benefits of Improving Energy Efficiency</b>
<b>3</b>	<b>Buildings as a System</b>
<b>4</b>	<b>Energy Efficiency Awareness Programs</b>
4	Steps to Developing an Energy Efficiency Awareness Program
4	Step 1: Assemble the Team
4	Step 2: Set the Objectives
4	Step 3: Focus on Communications
5	Step 4: Complete an Assessment
5	Step 5: Implement Actions
5	Step 6: Recognize Efforts
5	Step 7: Evaluate Program and Track Results
<b>6</b>	<b>Energy Conservation Actions</b>
<b>6</b>	<b>Water</b>
6	Action 1: High Efficiency Water Fixtures
<b>7</b>	<b>Natural Gas</b>
7	Action 2: Programmable Thermostat
8	Action 3: Door/Window Seals, Sweeps and Weatherstripping
9	Action 4: Insulate Water Heater Pipes
9	Action 5: Water Heater Thermal Blanket
<b>10</b>	<b>Electricity</b>
10	Action 6: Power Down Electronics and Equipment
11	Action 7: Appliance Thermometer
11	Action 8: LED Lighting Upgrade
<b>15</b>	<b>Conclusion</b>
<b>16</b>	<b>Additional Resources</b>

---

# INTRODUCTION

Do you work or volunteer for a local business or community organization? Are you looking to improve the environmental performance of your building, reduce energy consumption or potentially lower operational costs? You have come to the right place!

The EnergyWise Guidebook for Organizations was developed based on industry research and participant's experiences in The City of Red Deer's EnergyWise Pilot Program for Organizations. Through this program, The City worked with local groups to understand the barriers and challenges in making building improvements and worked to provide lower cost solutions that were simple to install and are likely to receive a good return on investment.

Use this Guidebook to get started down the path of energy efficiency. It will provide background information and research, recommended actions and digital resources. It is by no means

an all-encompassing book and we encourage you to check out the many great resources online - [Natural Resources Canada](#) is a good place to start. Transforming a building and developing an energy efficiency program takes time and effort, but we are here to help. Now let's get started!

**Throughout this Guidebook, we will refer to commercial buildings, which includes a variety of spaces such as: office buildings, retail stores and restaurants, community halls, churches, etc.**

---

## WHAT IS ENERGY EFFICIENCY?

In Alberta, buildings use energy for both heat and electricity. Heat is usually provided by natural gas and is often the source of space and water heating. Electricity is provided by a mix of natural gas and coal, with a smaller portion being supplied by renewables such as wind or solar.

Being energy efficient means living our lives the way we are used to, only using less energy to do so. Essentially, less energy is needed for the same effect. For example, an LED bulb uses approximately 75% less electricity than an incandescent bulb to produce the same light.

**Energy efficiency also contributes towards:**

**1. Comfort:** buildings stay warm in the winter, cool in the summer and are free of cold spots and drafts. In times of extreme weather conditions or a power outage, buildings are at less of a risk of temperature changes.

**2. Health and safety. Proper air circulation helps:**

- a. Control humidity and prevent moisture from building up (moisture can cause mould)
- b. Protect against health risks, including breathing problems caused by mould

**3. Environmental stewardship:** using less energy helps improve air quality and reduce greenhouse gas emissions, which contribute to climate change. Energy efficiency supports [The Environmental Master Plan](#), which includes community energy use, air quality and greenhouse gas emissions targets.

---

# BUILDING ENERGY USE

Many factors influence the amount of energy used in a building including:

- Size
- Age
- Type
- How it is used or how often

In commercial buildings, much of the energy used is consumed through lighting, HVAC systems, office equipment and refrigeration, although this will vary depending on the factors listed above.

For example, an office space, with many computers, monitors and printers may allocate a higher portion of energy to office equipment, while a church or community hall may allocate a higher portion to cooking and refrigeration due to events.

Completing a Walk-Through Building Assessment will provide you a better understanding of your particular building and how to prioritize energy efficient actions and building upgrades.

## AVERAGE ENERGY END USE OF COMMERCIAL BUILDINGS



- 20% Lighting
- 7% Refrigeration
- 10% Ventilation
- 15% Cooling
- 8% Office Equipment
- 2% Cooking
- 19% Space Heating
- 4% Water Heating
- 15% Other

Source: Center for Sustainable Systems (University of Michigan)

---

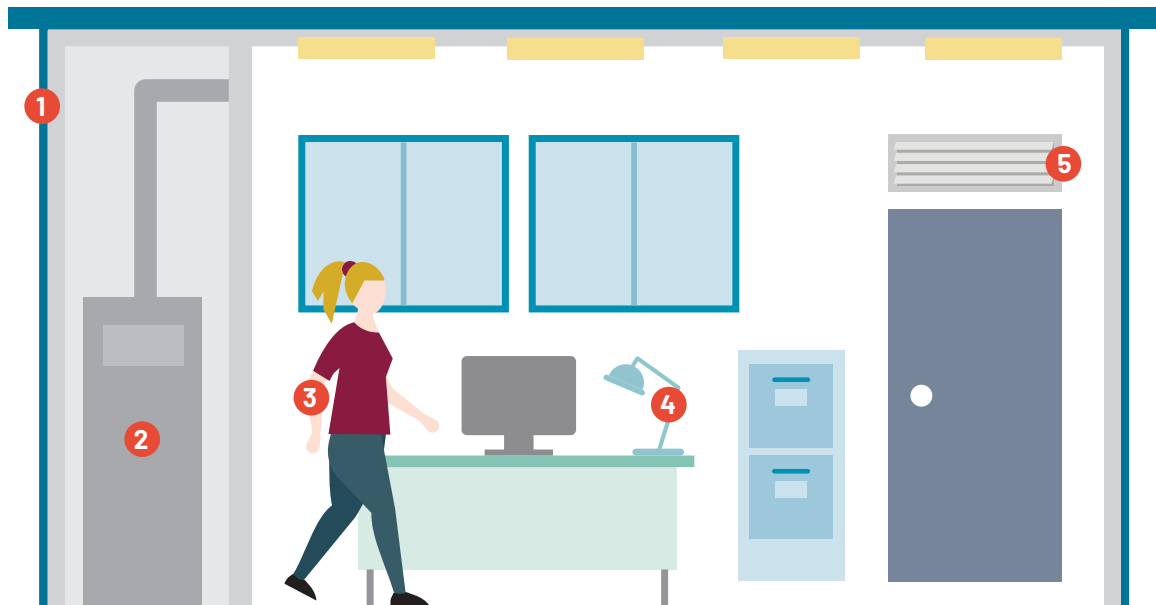
# BENEFITS OF IMPROVING ENERGY EFFICIENCY

An energy efficiency program can provide organizations a variety of benefits including:

- Reduced energy use (natural gas, electricity and water)
- Improved building occupant comfort
- Reduced greenhouse gas emissions
- Potential to reduce operational costs
- Team building, as staff or volunteers work to make improvements
- Behaviours learned by staff or volunteers can be transferred to their homes

# BUILDINGS AS A SYSTEM

The building operates as a system, with all parts working together.  
Parts of the building include:



## 1. Building Envelope:

Walls, roof, doors and windows

## 2. Mechanical systems:

Furnace, hot water tank, ventilation and air conditioning

## 3. Building occupants / users

## 4. Electrical systems:

lighting and electronics and turn off when not in use.

## 5. Indoor and outdoor environment:

Moisture, heat and air

Each of these affects one another and changes to a building can shift the balance, so it is good to have an understanding of possible unintended impacts. For example, the building envelope is made airtight by sealing up leaks, which can increase occupant comfort and reduce energy loss. At the same time, sealing up leaks may increase the humidity levels so ventilation (air circulation) should be assessed in order to maintain healthy indoor air quality and prevent moisture buildup.

A comfortable and healthy building is in balance and can reduce energy use and maintenance costs. Building that are out of balance may show signs such as moisture on the windows, odours, and/or mould, which may lead to higher operational costs. This Guidebook will provide strategies to address some of these challenges.

***EACH OF THESE AFFECTS ONE ANOTHER AND CHANGES TO A BUILDING CAN SHIFT THE BALANCE, SO IT IS GOOD TO HAVE AN UNDERSTANDING OF POSSIBLE UNINTENDED IMPACTS.***

---

# ENERGY EFFICIENCY AWARENESS PROGRAMS

The success of an energy efficiency program depends on the people involved. Whether a small office or a place of worship, key individuals need to be involved in the decision making and everyone who uses the building should be aware of the program. Training staff and building users on energy efficiency keeps them informed and involved in the process, giving them ownership over the changes and successes.

## [Steps to Developing an Energy Efficiency Awareness Program](#)

1

### ASSEMBLE THE TEAM

**To ensure program success, the ‘right’ people need to be involved. Gain management support and engage key individuals from the beginning, as time, effort, and financial resources will be needed to complete the work.**

If operating a non-profit or place of worship, look to volunteers, who may have a wide variety of skill sets that could help with the project.

Recruit an *energy champion* to keep the team motivated. As the program evolves, people will need to be re-engaged and having a few dedicated individuals will help keep the team moving forward.

Form a [Green Team](#), to provide direction and recommendations to staff on environmental projects and initiatives. Look for people from across the organization to ensure a wide range of experience, skills and perspectives.

2

### SET THE OBJECTIVES

**Dedicate time to setting program objectives.**

Do you want to reduce energy use by a certain percentage over time? Or, do you want to focus on behaviour changes, such as ensuring computer monitors are turned off at the end of each day?

These objectives will help keep the program on track and remind staff of why their involvement is important.

3

### FOCUS ON COMMUNICATIONS

**Keep all staff and building occupants informed of the changes.**

Let them know what work is being done and why and encourage them to get involved, where possible. Tailor approach to what works for the organization. Examples include email, newsletters,

posters or even short video clips. As you work through the program, don't be afraid to share successes and benefits from the work being put in.

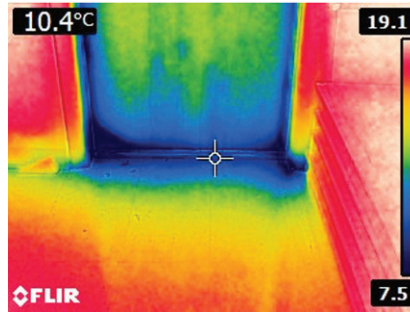
# 4

## COMPLETE AN ASSESSMENT

To understand the outcomes, you need to establish a baseline.

You will want to review previous utility bills, determine when and who uses the building and conduct a Building Energy Assessment. Assessments should be conducted by staff or volunteers who are familiar with the building and its operations. Check out the Assessment Toolbox for resources.

A bit of pre-work ahead of the assessment will help it run smoother. Ensure access to all rooms in the building, including the furnace room and all office spaces. If possible, borrow the [thermal imaging camera](#) from [Red Deer Public Library](#), which will allow you to evaluate the building envelope and to see what is going on behind the walls. This device can highlight insulation concerns, as well as where drafts and leaks may be occurring.



Thermal image taken during Pilot Program - indicates heat loss through exterior door

### Assessment Toolbox

- Building Energy Assessment Checklist
- [EnergyStar® Treasure Hunt](#)
- ROI Tools

# 5

## IMPLEMENT ACTIONS

Once you have completed the building assessment and established a baseline, it's time to determine which actions to implement.

Review consumption rates, the thermal images and the ROI Tool from the Assessment Toolbox to aid in this process. The chosen actions will depend on the building and its condition. We have

included common, lower cost actions below, with additional links and information in Additional Resources.

# 6

## RECOGNIZE EFFORTS

Changing behaviours and habits can be a challenge so it's always best to recognize efforts put in.

Give a shout out to staff at meetings or include highlights in organization newsletters, for example. Develop a simple process to recognize the hard work being put in and the benefits to all

building users. People tend to feel more engaged when they know their efforts are recognized and having a positive impact.

# 7

## EVALUATE PROGRAM AND TRACK RESULTS

Once the new measures are in place, most building users should have no concerns and may not even notice a difference (which is a good thing!).

Listen for feedback on the lighting, room temperature and comfort and make any adjustments as needed. Continue to monitor

energy use and building occupant behaviours to determine program effectiveness and if any modifications should be made.

# ENERGY CONSERVATION ACTIONS

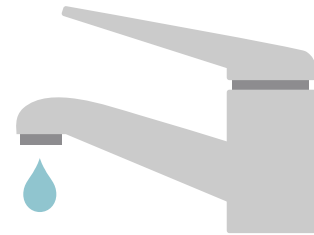
Now that you know the benefits of energy efficiency and how to create a program for your organization, let's dive into the Actions. The actions included are lower-cost and most can be completed by people with basic construction skills. To keep costs to a minimum, look to organization staff or volunteers for help, as many people in our organizations have a variety of skills to tap into.

The Actions are categorized by utility type: Water, Natural Gas, and Electricity. Complete a Building Energy Assessment to determine the most effective and impactful actions for your building. Before completing any action, always refer to the manufacturer's guidelines and ensure proper safety measures are being taken.

**In commercial buildings, Government of Alberta regulation may require specific tasks or actions to be completed by certified tradespeople. Contact [Alberta Apprenticeship and Industry Training](#) if unsure.**

## WATER

Organizations pay for water three times – once when purchasing from the utility, once to heat it and once to dispose of it as wastewater. Reducing total water use can lead to reductions in all these areas.



### ACTION 1: HIGH EFFICIENCY WATER FIXTURES



**Look for the WaterSense logo** when selecting high efficiency water fixtures.

#### Upgrade water fixtures to high efficiency by installing aerators.

These small devices attach to the end of a faucet and will reduce water use, while maintaining a similar feeling flow. Replace showerheads and pre-rinse spray valves with high efficiency models.

#### Ideal Flow Rates

- **Washroom Faucets:** 0.5 GPM (1.9 LPM) or less
- **Pre-rinse Spray Value:** 1.5 GPM (5.7 LPM) or less
- **Kitchen Faucets:** 1.5 GPM (5.7 LPM) or less
- **Showerhead:** 2.0 GPM (7.6 LPM) or less



### HOW TO: Calculate flow rate

If the faucet/aerator does not list the flow rate, use the steps below to calculate it. Replace or install an aerator as needed. [Details here.](#)

#### Materials needed:

- Large bucket or container
- Timer
- Measuring cup

**TIP: So the water used for the test does not go to waste, use it to water plants or for drinking.**

#### Steps:

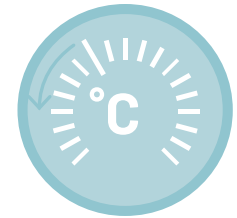
1. Set timer for 10 seconds
2. Place large container under faucet
3. Turn on cold water full-blast, while simultaneously starting the timer
4. Shut off water at exactly 10 seconds
5. Measure quantity of water in container using a measuring cup and convert to gallons (there are 16 cups in one gallon)
6. Multiply measured quantity of water by 6 to calculate flow rate in gallons per minute (GPM)

### HOW TO: Install faucet aerator and showerhead

[Details here.](#)

## NATURAL GAS

Natural gas is commonly used in Alberta as a source of heat or for cooking. Heating and cooling requirements can account for more than 45% of total commercial building energy use so any steps taken to reduce this consumption is beneficial. By improving the building envelope and several other actions, you can reduce your natural gas consumption and related greenhouse gas emissions.



### ACTION 2: PROGRAMMABLE THERMOSTAT



**Many commercial buildings have long periods when space is unoccupied (e.g. overnight or over a weekend).**

Install and set programmable thermostats to adjust room temperature based on occupancy, such as lowering the temperature at the end of the workday. The estimated energy savings are 10%, based on a 3°C drop for 8 hour/day, making this action worthwhile in most buildings. [Details here.](#)

#### Suggested Temperature Settings

- Unoccupied periods: 17°C
- Occupied periods: 20°C

#### TIPS:

**For best results, aim for no more than a 3°C to 4°C change.**

**It takes approximate 45-90 minutes for a furnace to warm a room. Only adjust temperature if the space is unoccupied for longer than this timeframe.**

# ENERGY CONSERVATION ACTIONS

## HOW TO: Set a Programmable Thermostat

1. Ensure the day and time on thermostat are accurate
2. Based on occupancy setting, set temperature/ timeframe accordingly  
*\*only adjust temperature when away from room for 4 hours or more*
3. **Look at fan setting:** “On” means the fan will run as long as the setting is engaged. “Auto” will only engage the fan when either the heat or air conditioning needs to be turned on.
4. **Location Considerations:** Thermostat should be on interior wall, away from direct sunlight, drafts, doorways, skylights or windows and keep furniture away from thermostat.



## ACTION 3: DOOR/WINDOW SEALS, SWEEPS AND WEATHERSTRIPPING



**Door sweeps and weatherstripping are strips of material (usually metal or rubber) used to seal the edges of doors and windows.** Caulking is a flexible material used to create a seal between doors/windows and the building. Over time, these materials become worn and break down, creating a gap in the seal and decreasing its effectiveness, causing air leaks and heat loss. Sealing up these leaks can help save more than 20% energy used for heating and cooling. [Details here.](#)

**HOW TO: Install Commercial Door Weatherstripping** [Details here](#)

**HOW TO: Caulk Like a Pro** [Details here](#)

**TIP: To estimate amount of weatherstripping needed, measure door or window perimeter then add 10% to accommodate waste** [\(Source\)](#)

## **ACTION 4: INSULATE WATER HEATER PIPES**

**As hot water travels from the water heater to the faucet, it loses heat.**

Placing insulated sleeves around the hot water pipes can reduce heat losses by approximately 4%. Look for sleeves with a minimum insulation value of R-4 for the best results.

During the Building Energy Assessment, determine if water heater is natural gas or electric powered. For safety reasons, follow the material type recommendations below.

- **Gas water heater:** Fiberglass pipe-wrap is recommended. Polyethylene or neoprene foam sleeves can be used, but insulation must be kept at least 15 cm away from the vent duct (flue).
- **Electric water heater:** Polyethylene or neoprene foam sleeves, secured with acrylic tape, are the most commonly used materials.

**HOW TO: Insulate Water Heater Pipes** [Details here](#)



## **ACTION 5: WATER HEATER THERMAL BLANKET**

**Wrapping a water heater in a thermal blanket can reduce heat losses by 25 – 45% and can save 7 – 16% on annual water heating costs (Source: US Department of Energy).** A simple test to determine if this is needed is to touch the outside of the tank; if you can feel the heat coming through, the tank is losing heat and could benefit from a wrap.

During the Building Energy Assessment, determine if water heater is natural gas or electric powered. Different materials may be required for the thermal blanket, depending on the fuel source.

**HOW TO: Install a Thermal Blanket** [Details here](#)

---

**BY IMPROVING THE BUILDING ENVELOPE AND SEVERAL OTHER ACTIONS, YOU CAN REDUCE YOUR NATURAL GAS CONSUMPTION AND RELATED GREENHOUSE GAS EMISSIONS.**

---



# ENERGY CONSERVATION ACTIONS

## ELECTRICITY

In Alberta, multiple fuel sources create the electricity we use including: coal, natural gas, wind, hydro and solar. It is used to power our lives including office equipment, kitchen appliances, lighting and more. Behaviours are very important here, as the simplest way to reduce electricity use is to turn it off. Encourage building occupants to turn off unneeded electronics and always turn off the lights when the last to leave a room.

(Source: [Alberta Electric System Operator](#)).



### ACTION 6: POWER DOWN ELECTRONICS AND EQUIPMENT



**Did You Know?**  
**When you turn off your computer, the monitor does not always turn off with it. Do a check. If you can see a light on the monitor, it's still on. Always be sure to turn off the computer and monitor at the end of the day (if IT systems allow).**

**Office equipment and other electronics account for approximately 8% of building electricity use in commercial buildings, with many items continuously plugged in and on 'standby'.** Standby power can account for 5-10% of a building's electricity consumption (Source: [NRCAN](#)), so steps taken to reduce this consumption can have noticeable effects on utility bills.

At the end of each day or when the space is no longer occupied, unplug or turn off all small appliances and electronics to reduce phantom loads. Add power bars in areas with multiple items or in hard to reach places, such as offices, meeting spaces or lunchrooms to make this easier.

- **Standby Power:** Electricity used by devices when they are turned off. Standby power allows electronics to turn on quickly, but also means they are constantly drawing power. e.g. television, computer (Source: [Energy Education](#))
- **Phantom Load:** Electricity used by devices that are left plugged in while not in use/turned on but still drawing power e.g. toaster, kettle (Source: [Energy Education](#))

**Looking for a way to measure the amount of electricity used by devices when they are turned on, turned off or on standby? Use a Kill-A-Watt Monitor! This easy-to-use item is available to borrow from RDPL as part of the [Energy & Water Conservation Toolkit](#).**

## ACTION 7: APPLIANCE THERMOMETER



**Many fridges and freezers use a small dial to set the temperature, but this does not indicate the actual temperature inside.** A thermometer is a simple way to know the actual temperature inside, which can reduce energy use and food waste, as items will be stored at the correct temperatures.

### Ideal Temperature Settings

- **Fridge Range:** 1°C to 4°C
- **Freezer Range:** -15°C to -18°C

**TIP: Purchase one thermometer for the building and move to each fridge or freezer to test. Also available to borrow from RDPL as part of the [Energy & Water Conservation Toolkit](#).**

## ACTION 8: LED LIGHTING UPGRADE



**LED bulbs are now standard for energy efficient lighting.** They require a fraction of the energy compared to incandescent or fluorescent bulbs, while maintaining the same brightness and feel in the room. Occupancy/motion sensors turn on lights as people enter the room and area ideal for locations where traffic is inconsistent (e.g. washrooms).

Lighting accounts for approximately 20% of total energy costs in commercial buildings. LED bulbs use up to 75% less electricity than incandescent bulbs and have a lifespan 2-3 times longer, while occupancy sensors can reduce lighting use by up to 30% once installed.

**Replacing lighting can be a significant cost to an organization. Tips to manage this include:**

- Replace bulbs as they burnt out with LEDs
- Look for sales or rebates on LEDs and purchase in bulk when possible
- Start with replacing individual bulbs first, then move on to lighting that requires the fixture to be modified

**LIGHTING ACCOUNTS FOR APPROXIMATELY 20% OF TOTAL ENERGY COSTS IN COMMERCIAL BUILDINGS.**

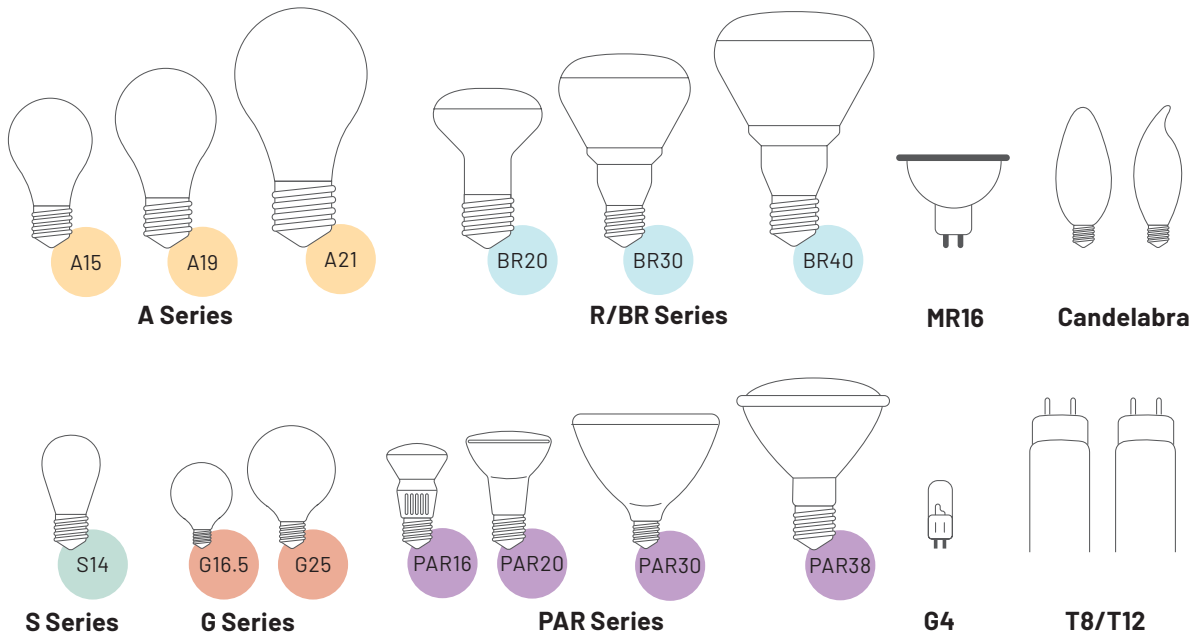
# ENERGY CONSERVATION ACTIONS

## CONVERTING TO LED BULBS

There are many different bulb types and converting to LED can feel overwhelming at first. Below are common bulb types, each with its own purpose and use. When purchasing new bulbs, it's

a good habit to bring the old one with you to the store for comparison or take clear photos so you know exactly what to look for.

## STANDARD LIGHTBULB TYPES



## WATTAGE EQUIVALENTS

Watts means the amount of energy the bulb uses to produce light. A lower number means less energy is used. Do not exceed the maximum wattage recommended for your fixture, as doing this is a safety hazard.

**WHEN PURCHASING NEW BULBS, BRING THE OLD ONE WITH YOU TO THE STORE FOR COMPARISON SO YOU KNOW EXACTLY WHAT TO LOOK FOR.**

Use the suggestions below to guide you.

Current Bulb	Watt	Replacement Bulb	Watt
Incandescent	40	LED	4 - 7
Incandescent	60	LED	7 - 11
Incandescent	100	LED	15 - 18
CFL	13	LED	7 - 11
CFL	23	LED	15 - 18
Halogen	50	LED	7
T12 Fluorescent Tube	34	T8 LED Tube	16
T8 Fluorescent Tube	32	T8 LED Tube	16

## COLOUR BRIGHTNESS

Lumens means the amount of light coming from the bulb. A higher number means brighter light; a lower number means dimmer light. Different activities require different levels of brightness (i.e. kitchen lighting compared to office lighting)

and selecting the right bulb may require adjustments.

Look for the lumens and watts listed on the front of the box.

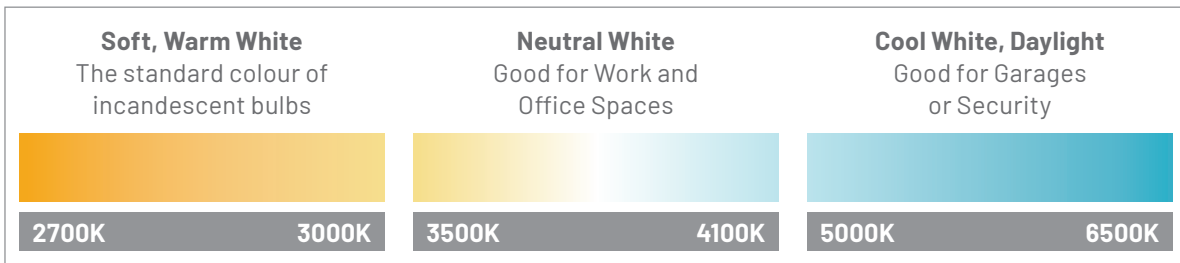
Use the suggestions below to guide you.

Incandescent Bulb	CFL Bulb	LED Bulb	LED Bulb
40 W	8 – 9 W	6 W	450 lumens
60 W	13 – 14 W	9 – 10 W	800 lumens
75 W	18 – 19 W	13 W	1100 lumens
100 W	23 W	16 – 18 W	1600 lumens

## COLOUR TEMPERATURE

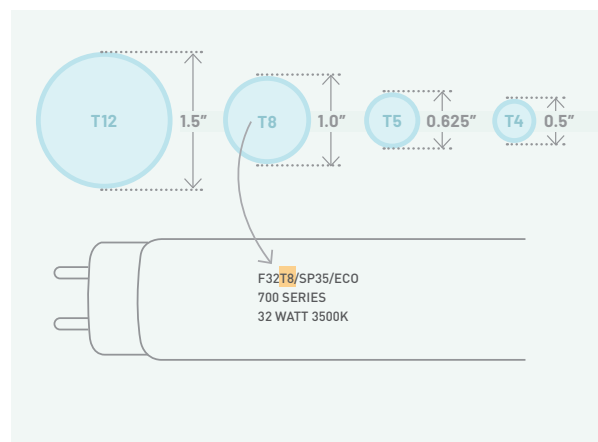
Kelvins (K) are the colour temperature of a bulb, indicating the warmth or coolness of the light. Getting this right can help alleviate concerns

of LED bulbs making rooms “feel cold” or not comparable to previous lighting. Values range from 2500 K to 6500 K.



## TUBE STYLE LIGHTBULBS

- Swap T12 tubes for T8s. As long as the pin base is the same, these bulbs are interchangeable. T8s require less energy, are usually lower cost to purchase and require less storage space due to the smaller size.
- To determine size of bulb:
  - Check the product label near the pin; or
  - Check the diameter: T12 = 1.5 inches; T8 = 1 inch; T5 = 0.625 inches; T4 = 0.5 inches



**Did You Know?** *Fluorescent bulbs contain mercury and should not be placed in regular garbage. Dispose of fluorescent bulbs, free of charge, at The [City's Waste Management Facility](#). (Includes both tubes and coiled bulbs, limit of 50 bulbs)*

# ENERGY CONSERVATION ACTIONS

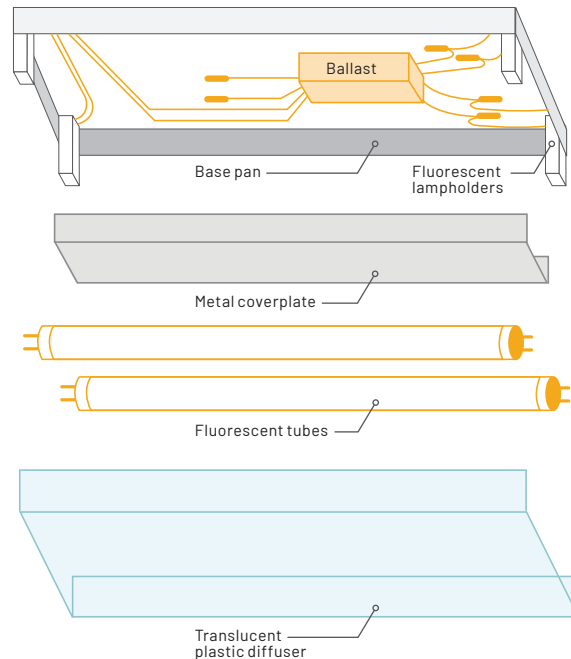
## WHAT IS A BALLAST?

In fluorescent lighting systems, a ballast regulates the current and provides voltage to start the lamps (bulbs). Without the ballast, the light would receive continuous current, causing the lamp to overheat and burn out. When replacing\* fluorescent tubes (T12 or T8) with LED tubes, the ballasts should be removed, as they are not needed for LED tubes to function.

There are LED tubes on the market that indicate they can be installed directly into a fluorescent fixture (aka 'plug and play'). Although these bulbs will work, they are still using additional electricity, as the ballast is drawing power, and this additional current can cause the LED bulb to burn out faster. Based on our Pilot Program, we would recommend selecting standard LED tubes and taking the extra step to remove the ballasts\* to ensure the bulbs are working properly and most efficiently.

**\*Government of Alberta regulations stipulate this work must be completed by a certified electrician in all commercial buildings. Contact [Alberta Apprenticeship and Industry Training](#) for more details on these specifications.**

## Fluorescent Tube Lighting Fixture



***BASED ON OUR PILOT PROGRAM, WE WOULD RECOMMEND SELECTING STANDARD LED TUBES AND TAKING THE EXTRA STEP TO REMOVE THE BALLASTS\* TO ENSURE THE BULBS ARE WORKING PROPERLY AND MOST EFFICIENTLY.***



# CONCLUSION

You can improve the environmental performance of your building, reduce energy consumption and potentially lower operational costs by implementing these relatively simple and low-cost solutions. Once you have completed them, consider larger upgrades such as replacing windows with triple paned glass, adding insulation to the roof or exterior walls or upgrading an inefficient furnace or hot water heater.

## STILL NOT SURE IF ENERGY EFFICIENCY IS WORTH IT?

Let's break down some numbers from one of the Pilot Program participants.

<b>Type of Organization:</b> Place of Worship (Small sized, less than 100 seats)	<b>Building Size:</b> 9,300 square feet	<b>Hours of Operation:</b> Office hours daily, community groups in the evening and service on Sundays	<b>Approximate Cost for Implementation:</b> \$2200 (materials only, excludes contractor or installation costs)
---	--	---	---

Utility Type	Average Annual Consumption	Estimated Annual Savings	Percent Reduction	GHG Reduction
Water	75,000 L	24,580 L	33%	4,944.1 kgCO <sub>2</sub> e/yr
Natural Gas	342.3 GJ	135.1 GJ	39%	
Electricity	13,014 kWh	6,118.6 kWh	47%	

## EQUIVALENCIES COMPARISON FOR ESTIMATED SAVINGS

**Water:** Equivalent to water used by one Red Deerian for 18.5 weeks

**Natural Gas:** Equivalent to energy used by 1.3 homes for one year

**Electricity:** Equivalent to electricity used by 0.5 homes for one year

Action Taken	Energy Reduction	Energy Savings	GHG Reduction (kgCO <sub>2</sub> e/yr)
Installed high efficiency water fixtures	80% ↓ in water use	24,582.75 L	21.09
Replaced all lighting with LED	75% ↓ in electricity use	5,468.1 kWh	4422.81
Installed power bars in office spaces	5-10% ↓ of electricity bill	650.5 kWh	490.46
Insulated hot water pipes	4% ↓ of heat loss from water heater	0.5 GJ	0.034
Added thermal blanket to hot water heater tank	7-16% ↓ in water heating costs	0.6 GJ	0.043
Set thermostat based on building occupancy	10% ↓ per 3°C drop for 8 hours/day	55.2 GJ	3.98
Improved building envelope: Replaced weatherstripping and door sweeps on two exterior doors Replaced caulking around windows	20% ↓ of energy for building	78.8 GJ	5.69

---

# ADDITIONAL RESOURCES

**Calculate kWh of Light Bulbs:**

<https://www.wikihow.com/Calculate-Kilowatts-Used-by-Light-Bulbs>

**City of Red Deer Environmental Master Plan:**

<https://www.reddeer.ca/city-government/plans-and-projects/ongoing-plans-and-projects/environmental-master-plan/>

**Electricity in Alberta (AESO):**

<https://www.aeso.ca/aeso/electricity-in-alberta/>

**Energy Management Best Practices:**

[https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/oeefiles/pdf/publications/commercial/best\\_practices\\_e.pdf](https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/oeefiles/pdf/publications/commercial/best_practices_e.pdf)

**Greenhouse Gas Equivalencies Calculator:**

<https://oeefiles.nrcan.gc.ca/corporate/statistics/neud/dpa/calculator/ghg-calculator.cfm>

**Natural Resources Canada:**

<https://www.nrcan.gc.ca/buildings/20671>

**Payback Period Calculator:**

<https://www.energystar.gov/buildings/tools-and-resources/building-upgrade-value-calculator>

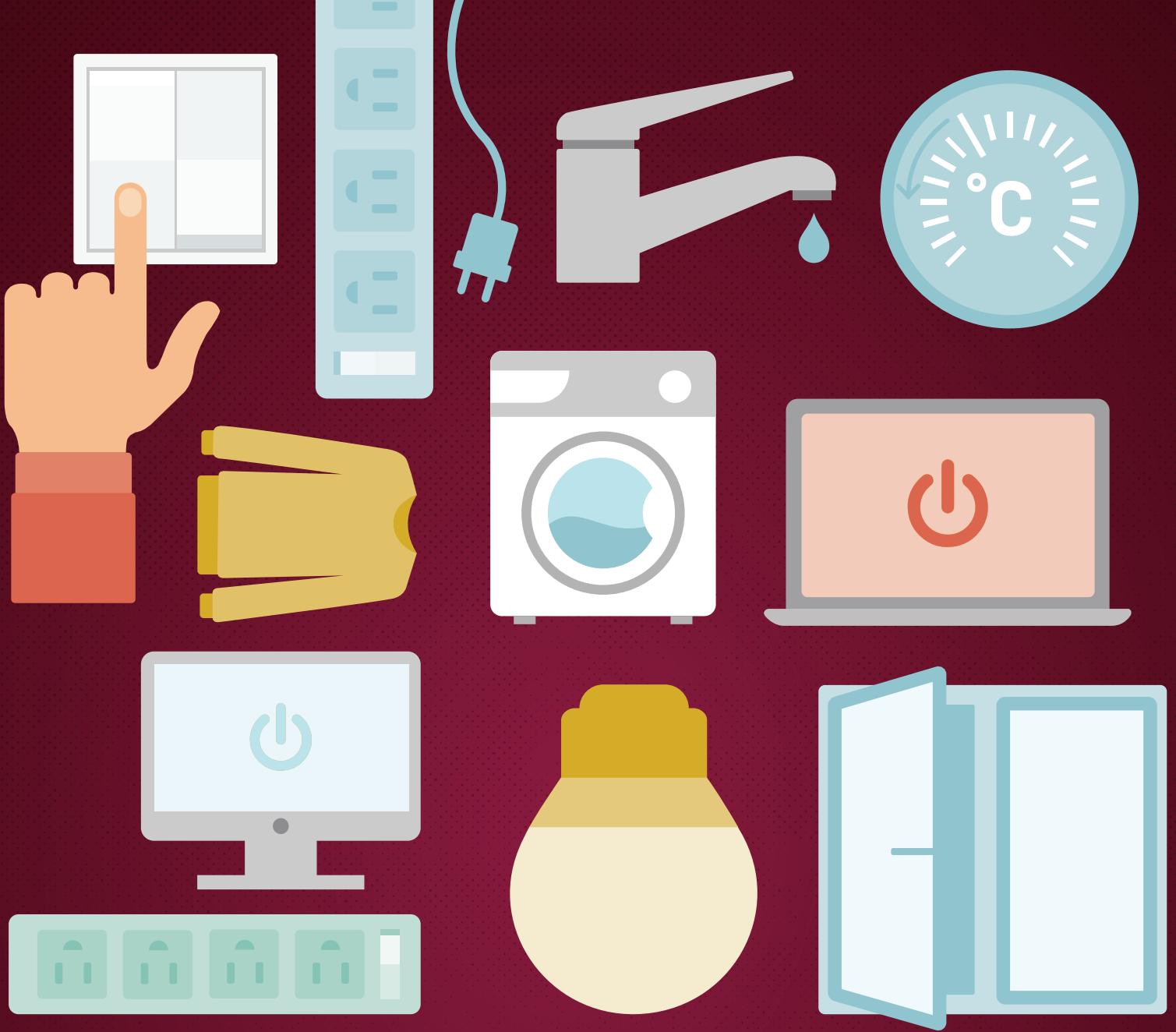
**Red Deer Public Library Resources:**

Energy & Water Conservation Toolkit: <https://rdpl.bibliocommons.com/item/show/455502058>

Thermal Imaging Camera: <https://rdpl.bibliocommons.com/item/show/350633058>

**Unit Converter:**

<https://www.unitconverters.net/power/kilojoule-hour-to-kilowatt.htm>



## **ENERGYWISE GUIDEBOOK** for Organizations

For more information:  
[Environmental.initiatives@reddeer.ca](mailto:Environmental.initiatives@reddeer.ca)