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Basic Facts About Residential Lighting

A bulb is not just a bulb – and a fixture is not just a fixture – anymore

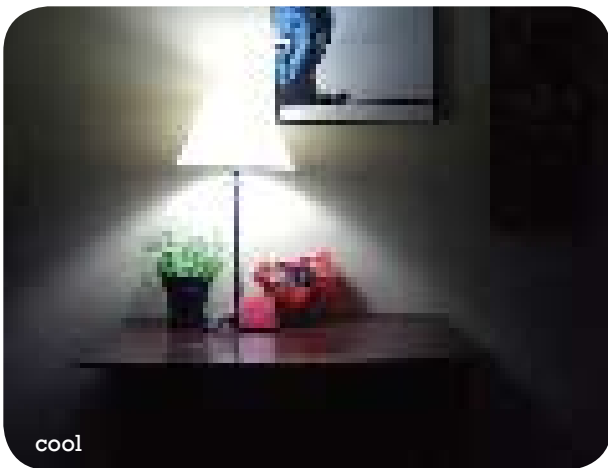
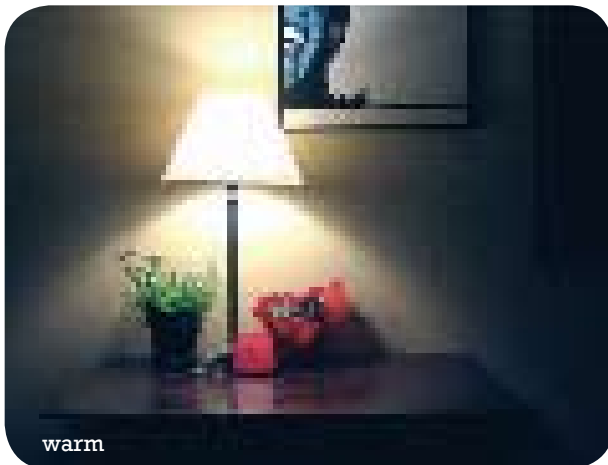


Canada 

Quality rhymes with efficiency

Quality and energy efficiency are the order of the day for Canadians when it comes to lighting. Energy-efficient, cost-effective bulbs and fixtures are available to meet your needs – whether you are looking for shadow-free lighting in the kitchen, flattering illumination in bathrooms, a soft chandelier glow in the dining room, mood and accent lighting in the family and living rooms or security lighting outdoors.

Lighting technology has evolved dramatically over the past 15 years with the introduction of compact fluorescent lamps (CFLs), also known as compact fluorescent light bulbs, light-emitting diodes (LEDs) and a new generation of energy-efficient fixtures. And more exciting developments are on the horizon. So think twice the next time you need to replace a bulb or a light fixture. Light quality and ambience don't have to be sacrificed to affordability and efficiency.



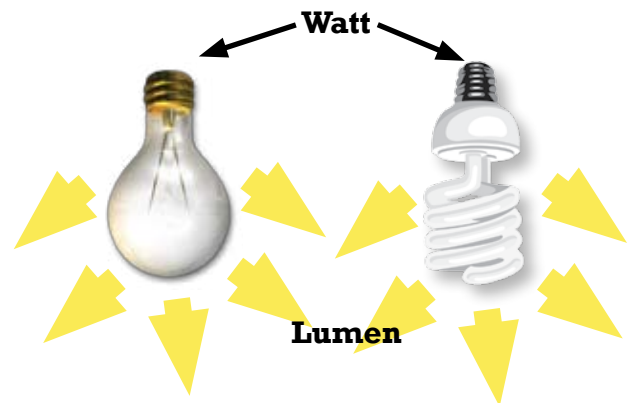
Colour temperature – The colour of white light is often described as warm or cool, cool being closer to natural daylight. Kelvin (K) is the unit of measure for the colour “temperature” of white light. Lower K lamps give off a warmer white, while higher K lamps emit a cooler white.

Lumens and Watts

When you buy light bulbs, keep in mind that the wattage rating is not a measure of light output, but a measure of the amount of energy the bulb uses (e.g. a 60-watt [W] bulb uses 60 watt-hours of energy per hour of use). Light output, on the other hand, is measured in “lumens.”

Different types of bulbs and fixtures produce different amounts of light (lumens) from the same amount of energy. CFLs, for example, use up to 75 percent less electricity to produce the same amount of light as an incandescent bulb (see the table on the next page).

Watt – The unit of measure for the rate of electric power consumed by lamps and other devices.



Lumen – A measure of the quantity of light emitted by a light source, also called luminous flux.



ENERGY STAR®
*The international symbol
for energy efficiency*

One of the best ways to sort through the wide selection of bulbs and fixtures available today is to look for products that have the ENERGY STAR symbol. ENERGY STAR qualified products use less energy, which not only saves you money but also helps protect the environment. ENERGY STAR qualified CFLs and residential light fixtures are sold at home improvement centres, hardware stores, lighting specialty stores and other retail outlets across Canada.

Luminous efficacy/efficiency – The ratio of light produced to energy consumed. It is measured as the light output (lumens) of a light source divided by the total power input (watts).

ENERGY STAR qualified CFLs must meet strict efficacy requirements. As well, they must meet minimum requirements for light output if they claim to be a replacement for a higher-wattage incandescent bulb.

Incandescent and CFL light output by wattage		
Standard incandescent bulb (watts)	ENERGY STAR qualified CFL (approximate equivalent watts)	Minimum light output (lumens)
40	9-13	450
60	13-15	800
75	18-25	1100
100	23-30	1600
150	30-52	2600

Note: This table is a guide only; output in lumens varies among makes and models.

Light bulb efficiency varies from one manufacturer to the next, so be sure to check the package for a product's light output, energy use and expected life. The ENERGY STAR symbol is your assurance that the package labelling is accurate.

It is not just the bulb - it is the fixture too!

Buying energy-efficient fixtures is another great way to control your lighting costs and help the environment. ENERGY STAR qualified fixtures deliver the same lighting as standard fixtures but use about 67 percent less energy. They are available in countless attractive styles for virtually every application inside and outside the home. Also, these fixtures come in various types, including table, floor and desk lamps, and hard-wired fixtures for ceilings, walls, bathrooms, kitchens, dining rooms and porches.

To qualify for ENERGY STAR, residential light fixtures must consume at least two thirds less energy than conventional fixtures and use bulbs that are designed to last at least 10 000 hours.

Ceiling fans with lights must be 50 percent more energy efficient than a standard fan/light combination and must move air up to 20 percent more efficiently than a standard model. ENERGY STAR qualified fixtures must also have a two-year warranty, which is double the industry standard.

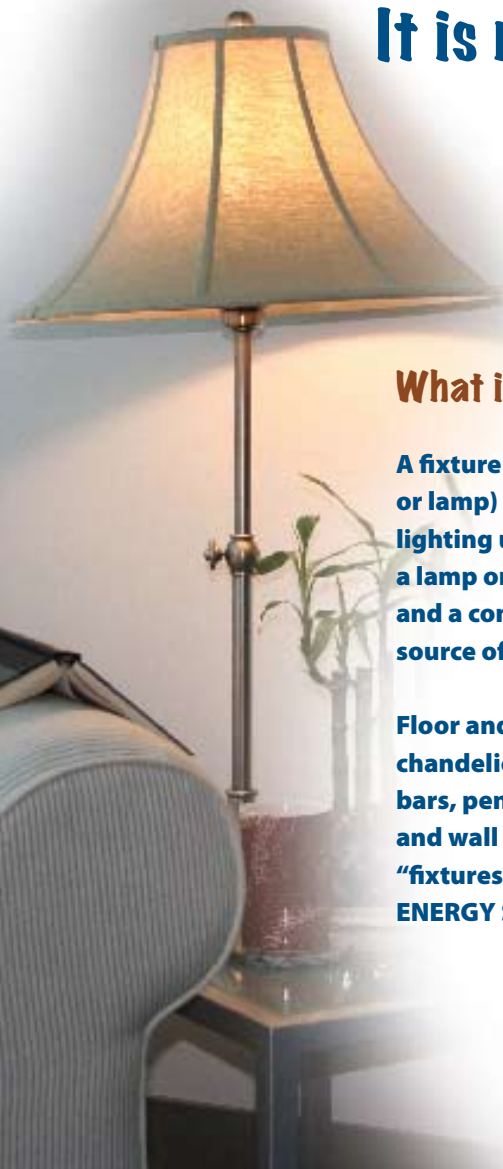
Building a new home?

You have an opportunity for major savings. By opting for energy-efficient lighting throughout your home, you can reduce your electricity costs by \$100 to \$150 a year. Ask your builder or contractor for help in choosing energy-efficient lighting.

What is a fixture?

A fixture (or luminaire or lamp) is a complete lighting unit consisting of a lamp or lamps, housing, and a connection to a source of electrical power.

Floor and desk lamps, chandeliers, vanity light bars, pendulum lights and wall sconces are all "fixtures" and can be ENERGY STAR qualified.



How much money can you save?

The more you invest in energy-efficient lighting, the more you will save in the long term. This is true whether you are replacing incandescent bulbs a few at a time, designing a new lighting system for a renovation or building a new home.

A typical house has 26 light bulbs that use about \$200 worth of electricity each year. Replacing just five incandescent bulbs with ENERGY STAR qualified CFLs in high-use fixtures (lights that are on more than three hours a day) saves approximately \$30 a year. Replacing incandescent bulbs throughout your home with ENERGY STAR qualified CFLs and fixtures could save as much as \$125 a year.

Cost comparison of a 60-W incandescent light bulb versus a 15-W ENERGY STAR qualified CFL

	60-W incandescent	15-W CFL (ENERGY STAR qualified)
Initial cost (a)	\$0.50	\$3.00
Light output (lumens)	800	800
Life of bulb (hours)	1000	10 000
Replacement light bulbs (b)	9 @ \$0.50 = \$4.50	–
Lifetime electricity cost (c) (at \$0.10 per kilowatt-hour [kWh])	10 000 hours × 60 W × \$0.10/kWh = \$60.00	10 000 hours × 15 W × \$0.10/kWh = \$15.00
Total lifetime cost (a + b + c)	\$65.00	\$18.00
Savings	–	\$47.00

Note: This table is a guide only.

It is important to choose your lamp or fixture according to the application, such as outdoor, task, ambience, dimming and sensor lighting.

For maximum impact, install ENERGY STAR qualified CFLs and fixtures. ENERGY STAR qualified fixtures are designed for high efficiency technology such as CFLs. Older fixtures are not necessarily designed to optimize light output of high efficiency lamps. Here are some shopping tips:

- Consider fixtures and bulbs made specifically for task lighting, so light can be concentrated where you need it most.
- If you are using linear fluorescent lamps, choose T-8 lamps with electronic ballasts - they are 25 percent more energy efficient and create less flicker and noise than T-12 lamps.
- Consider using photocells, motion sensors or timers so the lights are on only when needed.
- Be sure to check the packaging to ensure that the bulb you choose is designed for the application intended.

How does energy-efficient lighting help the environment?



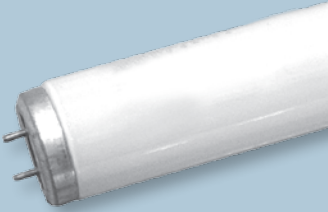


Much electricity used in Canada today is generated by burning fossil fuels that generate harmful greenhouse gases (GHGs) that contribute to climate change. Using less electricity to light your home helps reduce GHG emissions.

If every household in Canada replaced just one standard incandescent light bulb with an ENERGY STAR qualified CFL, Canadians would reduce GHG emissions by 400 000 tonnes – equivalent to taking 70 000 cars off the road for a year – and save more than \$73 million a year in energy costs.

Although there is currently no substance that can replace the properties of mercury to produce light in efficient fluorescent lamps, manufacturers have reduced the amount of mercury used in lamps. Some manufacturers have voluntarily reduced the mercury content in CFLs by about 80 percent over the past 10 years, to as little as 2 milligrams per bulb. Research is ongoing to achieve further reductions.



What are your lighting options?

Light type	Characteristics
<p>Incandescent – a bulb in which light is produced by passing an electric current through a thin filament (usually tungsten)</p> 	<ul style="list-style-type: none"> • traditional light bulb that Canadians have been using for more than a century • low initial cost but the highest operating costs <ul style="list-style-type: none"> - only 4 to 6 percent of the electrical energy used by an incandescent bulb is converted into visible light - 94 to 96 percent is wasted as heat • very short life • 750 to 1000 hours (approximately half a year of operation) • dimmable (although often noisy when dimmed) • has a colour rendering close to daylight • some types produce fewer lumens (less light) – these types are marketed as long-life or energy savers <p>Note: New energy-efficient bulbs will be introduced to meet the 2012 standards for general service lighting.</p>
<p>Halogen – a type of incandescent light bulb that contains a chemical called halogen, which minimizes filament wear and results in a long life – 3000 hours, or approximately 2 years</p> 	<ul style="list-style-type: none"> • a wide array of shapes and sizes • best suited where focused light is needed in a small area (task, track or accent lighting) • offers excellent beam control and maintains light intensity throughout its lifetime • brighter, whiter and longer lasting than standard incandescent bulbs • operates at high temperatures; should not be installed near drapes or other flammable materials
<p>Linear fluorescent lamp – a low-pressure tubular lamp in which current flows through ionized gas (argon and mercury) to emit ultraviolet rays that are converted to visible light by a layer of fluorescent coating (usually phosphor) inside a glass tube</p> 	<ul style="list-style-type: none"> • very energy efficient • T-8 or T-5* lamps use electronic ballasts that make them more energy efficient than older T-12 lamps • today's lamps are available in a warmer colour rendering than older ones • often used in fixtures that are part of a room's architecture or design (e.g. above or below a cabinet and in valances, soffits or coves) • best suited where bright general lighting is needed, as in kitchens, laundry rooms and workshops • requires specialized disposal (according to municipal guidelines) because of mercury content that is more than double the amount contained in a CFL • may not be suitable for some locations because of their length <p>* The letter T designates that the bulb is tubular in shape. The number expresses the diameter of the bulb in eighths of an inch.</p>
<p>Compact fluorescent lamp (CFL) – a fluorescent light bulb that fits in a small space</p> 	<ul style="list-style-type: none"> • provides the same amount of light as a traditional incandescent bulb but uses up to 75 percent less energy • lasts 10 times longer than an incandescent bulb • available in many shapes, sizes and styles; fits in most fixtures, indoors and outdoors • available in various colour temperatures: warm white to cold white, including the characteristic warm glow of incandescent bulbs • available as speciality bulbs, such as dimmable, reflector, candelabra and outdoor • requires specialized disposal (according to municipal guidelines) because of the mercury content
<p>Light-emitting diodes (LED) – tiny bulbs that are illuminated by the movement of electrons through a semiconductor, similar to an incandescent bulb</p> 	<ul style="list-style-type: none"> • extremely energy efficient – can reduce energy consumption and costs from 85 to 90 percent compared to an incandescent bulb • long-lasting, durable, compact and produce highly visible light • used in decorative light strings, such as holiday lights. They are currently the only decorative light strings that meet the criteria for ENERGY STAR qualification. • used widely in exit signs, traffic lights, computers and electronics, and in automobiles • some LEDs are available for desk top or direct lighting, but the selection is limited • expected to become an effective replacement for many applications although some issues (related to efficacy and cost) need to be resolved

How useful is the information on the light-bulb package?

To save energy and costs, find bulbs with the light output you need (in lumens), then choose those that use the lowest number of watts.

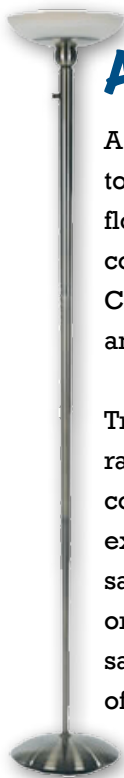
Most packages of light bulbs disclose information about the lamp performance and life, as shown below.

Light output Flux lumineux	Energy used Consommation d'énergie	Life Durée de vie
1200 lumens	13 watts	7000 hours/ heures

Lumens – The higher the number, the more light you will get.

Watts – The lower the number, the more you will save on your electricity bill.

Hours – The higher the number, the less often you will have to change lamps.



A word about torchieres

A safer and more energy-efficient alternative to halogen and incandescent ceiling-directed floor lamps, also known as torchieres, is the compact fluorescent torchiere (CFT). A typical CFT uses a 55-W CFL to produce the same amount of light as a 300-W halogen lamp.

Traditional torchieres use halogen lamps that range from 300 to 600 W. These lamps not only consume a lot of energy, but they operate at extremely high temperatures and can be a safety hazard if placed too close to curtains or other combustible materials. In addition to saving energy, CFTs produce a minimal amount of heat, thus addressing safety concerns.

What is on the horizon?

In April 2007, the Government of Canada announced that it will introduce national standards for lighting efficiency by 2012. This will result in the phasing-out of inefficient lighting, which will mean significant cost savings for consumers, businesses, governments and other organizations as well as important environmental benefits in the form of reduced greenhouse gas emissions.

The phasing-out will be achieved by setting minimum efficiency levels for lamps, not by banning a particular technology. When the new national standards take effect, consumers will continue to be able to choose from a broad range of lighting technologies and find products that meet their needs just as they do today.

For more information about ENERGY STAR in Canada, visit energystar.gc.ca. Information about all aspects of energy efficiency is available at oee.nrcan.gc.ca. To obtain additional copies of this or other free publications on energy efficiency call:

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