

## COMMERCIAL LIGHTING PROGRAM

# Technology summary

Most of the following lighting technologies are supported by Manitoba Hydro's Commercial Lighting Program. View the Commercial Lighting Program incentives at [hydro.mb.ca/your\\_business/lighting/incentives.shtml](http://hydro.mb.ca/your_business/lighting/incentives.shtml) for current lighting incentives.

**NOTE:** It is important to ensure lighting is rated for the environment it is being installed in.

## Light emitting diode (LED) lighting systems

LEDs are semiconductor devices that convert electrical energy into light. They do not contain any moving parts, filaments, lead, or mercury.

LEDs are sensitive to heat and perform best in cooler ambient temperatures, so it is important to verify the lamp or fixture temperature rating. Higher temperatures may decrease the life and light levels of an LED system.

Lumens per watt measures lighting efficacy and LEDs are just as efficient or more efficient, than other lighting technologies.

### Benefits:

- Significant energy savings compared to incandescent, halogen, fluorescence, mercury vapor, metal halide, and high pressure sodium technologies;
- Lifespan of 50,000 or more hours;
- Life not affected by on/off cycling;
- Many are dimmable. Check with your lighting supplier to ensure compatibility with your dimming device;
- Various colour spectrums and colour temperatures are available (2,700–6,500K);
- Lower infrared (IR) and ultraviolet (UV) emissions compared to traditional lighting, which means lower heat output and significant reduction of surface damage;
- Silent operation and resistant to shock and vibration;
- Light output is not affected by low temperatures— in fact, they are brighter in cold environments.
- Available in a variety of wattages, sizes, and colours;

### What to ask:

If you are planning to upgrade your lighting systems, consult your contractor and/or lighting supplier before starting your project. Request the life-rating of the products as per the new Illuminating Engineering Society (IES) rating (LM80, TM-21). According to the IES, when the light output level drops to 70 per cent of the original light output level, this is described as the lamp-end-of life. LED lamps and fixtures typically do not fail completely when they reach the end of their useful life. As time goes on they give off less light, yet consume the same amount of power.



## LED screw-in lamps

LED lamps are designed to replace incandescent, halogen, and CFL lighting technologies. Installation is often as easy as changing out a screw-in or plug-in light bulb.

### Benefits:

- Long life of 50,000 or more hours. This means less frequent lamp replacement and less landfill waste;
- Up to 80 per cent energy saving compared to incandescent while lasting 25 times as long;
- Up to 70 per cent energy savings compared to halogen while lasting 8 times as long;
- Up to 20 per cent energy savings compared to CFL while lasting 3 times as long;
- LED lamps emit minimal (if any) ultraviolet and infrared radiation, which makes them less damaging to surroundings.



## LED fixtures

### Benefits:

- Longest lasting lighting products — 50,000 hours or more;
- Sealed construction with minimal ongoing maintenance;
- Comes with a warranty of 5–10 years;
- There are specific LED fixtures that work very well in cold temperatures;
- Have the same or improved light distribution with various styles and sizes available to accommodate existing installation details;
- Slim profiles are available which can increase the free space in the ceiling cavity.



### Considerations:

- Highest product cost;
- Installation costs are the same or less than LED retrofit kits.

## LED T8 linear lamps

### Benefits:

- Most specify a 50,000 hour life or about 2.5 times as long as T8 fluorescents;
- An excellent choice to upgrade T8 fluorescent fixtures;
- Highly-efficient, low cost, easily installed and maintained;
- When putting in LED T8's the ceiling cavity isn't disturbed as it can use the existing T8 fluorescent fixture;
- Easy to change the color temperature or lumen output after installation by simply installing a new lamp.

### Considerations:

- Ensure that the existing T8 ballast is compatible with the new LED T8 as most Rapid and Program Start ballasts have limited compatibility with LED T8's;
- T8 electronic ballasts need to be replaced every 80,000 to 100,000 hours (depending on ambient temperature);
- The light distribution of fluorescent T8s are omni-directional (360 degree lighting) and LED T8s are directional (down lighting), so consider doing a lighting mock-up to ensure appropriate lighting distribution in the working environment when upgrading to LED T8;
- The existing T8 fluorescent fixture being used should have its components inspected to ensure good working order and replace any deteriorated components;
- Keep LED T8s within the manufacturer warranted temperature range so they don't overheat and reduce the lamp life.

## LED retrofits

### Benefits:

- Long lasting product with 50,000+ hours of life;
- When retrofitting an existing fixture the ceiling cavity will not be disturbed;
- The old ballasts and sockets will be replaced and be fully compatible with the new LED lamp;
- The kit comes with a factory tested specification sheet allowing lighting designers to work with the product specs instead of having to set up a lighting mock-up to test performance.



### Considerations:

- Ensure compatibility between the existing luminaire and the LED conversion kit, the product supplier can provide this information;
- The product and installation costs tend to be higher than using LED specialty lamps; however, choosing a LED retrofit kit with longer rate hours of life can offset this higher initial cost.

## LED backlit signage

LED backlit signs use LEDs to replace neon tubes, T12 fluorescents, and other non-LED lighting technology.

### Benefits:

- 50,000+ hour product life, resulting in fewer system changes and disruptions and lower maintenance costs;
- Significantly more efficient than non-LED backlit systems;
- Lower voltage wires (less than 50 volts) compared to neon (10,000 volts or more) do not deteriorate or pose a fire risk, resulting in lower risk of property loss and lower insurance premiums;
- Emit a specific wavelength of light that can be customized to match the colour of the sign face material;
- Electrical connections ensure that an outage of one LED does not affect the entire system.

## Control systems

Controls can be used to intelligently automate lighting systems, offering the potential for significant energy savings. Occupancy and daylight sensors used with a computer system can control on-off operation and dimming. Improved user comfort, safety, and productivity are often overlooked benefits of lighting control.

There are two main categories of lighting controls:

- Manual controls, including local switching, part local switching, and group switching;
- Automated controls, including presence/occupancy controls, daylight linked sensors, and time controls.



### Benefits:

- Save energy and money by automatically shutting off lights during periods of inactivity;
- Increases the lighting products life by turning the lights off or dimming lights when not needed;
- Opportunity to dim lights during the day and take advantage of free, natural sunlight;
- Improve employee productivity with lighting more conducive to a working environment.

### Considerations:

Contact your supplier to confirm if your fixture or lamp is compatible with the dimmer control being purchased. When LEDs start flickering, this is an indication of non-compatibility between the dimming device and the fixture or lamp.

## T8 fluorescent lighting systems

T8s are 1 inch diameter fluorescent lamps that are the base case technology for lighting installations today. They are not as efficient as LED technology.

T8 energy efficient (EE) lamps are more energy efficient than regular T8 lamps, are very cost effective to install, and attract an incentive under the Commercial Lighting Program. While T8 EE lamps are a great replacement for standard T8 lamps, however, LED T8 linear lamps are an even more energy efficient choice.



T8

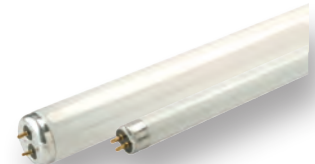
### Benefits:

- Same layout and design as T12 systems, but wider product range;
- 20 to 30 per cent more efficient than T12 systems;
- Hold light level better than T12 lamps;
- Still produce 90 per cent of original output after 40 per cent of average life;
- Quiet, virtually flicker-free operation;
- High performance fixtures (HPFs) direct more light downward, meaning fewer fixtures and lamps deliver the same amount of light;

## T5 fluorescent lighting systems

T5s are 5/8 inch diameter high-efficiency fluorescent lamps. T5 systems are ideal for design applications requiring indirect lighting. Note that T5 HO ballasts are not recommended for use in vapour-tight fixtures due to high heat build-up.

T5 energy efficient (EE) High Output (HO) lamps can directly replace original T5s. Available in four-foot lengths, these lamps provide greater energy saving with all the same features of standard T5s. The level of light generated by EE lamps may vary slightly from the original lamps.



T12

T5

### Benefits:

- Greater design flexibility than T8 fluorescents;
- Higher lumen output at higher temperatures than T12 and T8 fluorescent lamps;
- Hold light level better than T12 and most T8 fluorescent lamps;
- Still produce 95 per cent of original output after 40 per cent of average life;
- Offer more light, more uniformed distribution of light, better colour rendition, and greater efficiency than T8 fluorescents;
- T5 high output (HO) lamps offer higher light output, meaning fewer lamps per fixture;
- Less energy consumption than T8 fluorescents.

For more information, contact your Manitoba Hydro account representative or:

204-360-3676 (Winnipeg) or 1-888-624-9376  
powersmartforbusiness@hydro.mb.ca  
hydro.mb.ca/psfb

Power Smart for Business guidelines and incentive levels are subject to change without notice. August 2017.

Available in accessible formats upon request.