

Interior Lighting

Interior lighting covers a wide range of lamps, fixtures and lighting controls installed inside buildings. Lighting is required in almost any interior space to supplement light coming from windows, skylights or doorways. Different types of interior lighting are required in offices, meeting rooms, washrooms, cafeterias, warehouses, storage rooms and garages. This factsheet does not cover coloured lighting, displays, emergency escape lighting and exterior lighting of any type.



What are the key green issues?

- » **Energy Consumption:** Lighting accounts for approximately 11 percent of energy use in institutional and commercial buildings in Canada. Next to space heating and cooling, lighting is often the most energy intense component of a building's operations. A 6-8 watt LED lamp has the same lumen output as a 60-watt incandescent bulb or a 13-15 watt compact fluorescent.
- » **Resource Consumption:** Lamps and fixtures are often constructed using steel, aluminum, glass, copper and plastics. Each requires energy, water and other resources in their production. However, at the end-of-life, these materials are still valuable, particularly the steel and aluminum. Other recyclable materials include metals like aluminum and copper, and plastics.
- » **Climate Change, GHG Emissions and Air Pollutants:** Power generation is Newfoundland and Labrador's third largest source of GHG emissions behind transportation and large industry. Energy efficient lighting in buildings can play a role in reducing these emissions and climate change as well as improving local air quality.
- » **Hazardous and Non-Hazardous Waste:** Older T12 fluorescent lamps and ballasts contain mercury and are considered hazardous waste upon their removal from a building. Waste lamps, whether broken or intact, contribute about 1150 kg/yr of mercury to landfill.

How does energy efficient lighting advance Government's strategic priorities?

- ✓ **Reducing Climate Change, GHG Emissions and Air Pollutants**
By using more energy efficient lamps and fixtures, the amount of GHG emissions and air pollutants associated with electrical power generation is significantly reduced.
- ✓ **Improved Indoor Environments**
Lighting upgrades and retrofits often improve the quality and illumination in the working environment. This improves the ability for staff and employees to perform their work and enhances job satisfaction, productivity and safety.
- ✓ **Reducing Hazardous Waste**
Using low mercury containing lamps and mercury free ballasts will reduce the end-of-life liability associated with these wastes. During upgrades or retrofits, these hazardous wastes can be captured and properly disposed of to avoid contamination of soil or ground water. LED lamps can last up to 50,000 hours significantly reducing the need to replace lamps and associated maintenance costs.

Myth Buster

Today, LED lighting is of equal or better colour quality and illumination than traditional incandescent or fluorescent lamps. They also last up to 20 times longer than incandescent lamps and six times longer than compact fluorescents.

FACTSHEET #4: INTERIOR LIGHTING

Recommended	Why is it important?	How do I know I am getting it?
<p>✓ Lighting design is to meet or exceed the national energy code for Buildings (NECB 2011) or ASHRAE 90.1 -2010 or LEED NC 2009 or LEEDv4</p>	<p>Ensure the best possible energy efficient design for new systems or retrofits of existing systems to reduce the cost of operations while providing quality indoor environments.</p>	<p>Including commissioning agent and measurement and verification specialist from the design phase through construction will ensure that all systems function and perform as planned. Successful LEED certification and supporting documentation for Energy and Atmosphere and Indoor Environmental Quality Credits.</p>
<p>✓ Specify low or no mercury containing lamps are used</p>	<p>Reducing the risk and liability of handling and disposing of mercury containing lamps and fixtures at end-of-life.</p>	<p>Request RoHS Compliant lamps from suppliers.</p>
<p>✓ Lighting consultants should demonstrate at least three years' experience in lighting design and/or have a suitable professional qualification in lighting engineering and design.</p>	<p>It is important to ensure a qualified consultant is procured to create a resource and energy efficient design of new lighting systems or renovation of an existing lighting system.</p>	<p>The vendor shall supply a list of the persons responsible for the project, including managerial staff, indicating educational and professional qualifications and relevant experience. This should include persons employed by subcontractors where the work is to be sub-contracted. The contractor shall also supply a list of lighting schemes the tenderer has designed over the last three years as well as past client contact information.</p>
<p>✓ Contractors shall dispose of all old fixtures, ballasts and lamps in compliance with applicable solid and/or hazardous waste regulations</p>	<p>Reduces environmental risks associated with mercury and other pollutant emissions to soil, water and air.</p>	<p>Request supplier to provide proof of transfer to a licensed handler of hazardous waste.</p>

What else could I look for?

In addition to the minimum recommended criteria outlined above, there are stronger green attributes you can look for when making your purchasing decision.

Recommended	Why is it important?	How do I know I am getting it?
<p>Require lighting engineer, designer or contractors to conduct life cycle cost assessment</p>	<p>Such an assessment should include the initial cost of the installation, its estimated lifetime, replacement costs of lamps and their estimated life, and energy cost of the lighting over its lifetime. The contracting authority will need to define its electricity price and the rate at which this increases, and its interest rate on investments.</p>	<p>Provide standard calculation template to vendor and electricity price, rate increase and the government's standard discount rate. See Life Cycle Cost Calculation for Light Sources.</p>
<p>Environmentally preferable packaging should be used</p> <ul style="list-style-type: none"> Laminates and composite plastics shall not be used Cardboard and corrugated paper boxes shall be made of at least 50 percent post-consumer recycled material Where plastic materials are used, they shall be made of at least 50 percent postconsumer recycled material 	<p>Recycled and post-consumer content in packaging will contribute to reduced use of resources and the diversion of waste from landfills.</p>	<p>Ask your vendor for proof of the recycled packaging content.</p>
<p>Contractors shall take back all packaging</p>	<p>Reduce on-site waste production and additional handling by employees and staff.</p>	<p>Conduct site inspection after lighting installation.</p>

Resources

- LEED NC 2009 Reference Guide, Canada Green Building Council. URL: www.cagbc.org
- National Energy Code for Buildings 2011. National Research Council. URL: www.nationalcodes.nrc.gc.ca/eng/necb/index.html
- [Build Better Buildings Implementation Guide](#)
- The Swedish Environmental Management Council's Procurement Criteria for Indoor Lighting Products, version 2.0, 18 January 2011. URL: www.msr.se/en/green_procurement/criteria/Office/Lighting-products
- Life Cycle Cost Calculation for Light Sources, Swedish Environmental Management Council.
- ASHRAE 90.1, ASHRAE. URL: www.ashrae.org/resources--publications/bookstore/standard-90-1
- Building Life Cycle Cost Programs, US Department of Energy, 2013. http://energy.gov/node/782456/information/download_blcc.htmlwww.msr.se