

# REGULATORY IMPACT STUDY FOR GENERAL SERVICE FLUORESCENT LAMPS

PREPARED BY:  
ENERGY EFFICIENCY BRANCH,  
BC MINISTRY OF ENERGY AND MINES  
[HTTP://WWW.EMPR.GOV.BC.CA/EEC/STRATEGY/EEA/PAGES/DEFAULT.ASPX](http://www.empr.gov.bc.ca/EEC/STRATEGY/EEA/PAGES/DEFAULT.ASPX)

AUGUST 31<sup>ST</sup>, 2012

COMMENTS MUST BE RECEIVED BY OCTOBER 30, 2012

## Contents:

<i>Scope and Requirements</i> .....	2
<i>Assessment from an Industry Perspective</i> .....	6
<i>Cost Assessment from a Consumer Perspective</i> .....	7
<i>Assessment from a Provincial Government Perspective</i> .....	8
<i>Notes</i> .....	9

## SCOPE AND REQUIREMENTS

<p><b>TYPE OF DEVICE</b></p>	<p>A <b>General Service Fluorescent Lamp</b> is a tubular light bulb that requires a ballast to operate. In technical terms, it is a low pressure electric-discharge source in which a fluorescing coating transforms some of the ultraviolet energy generated by a gas discharge into light. For the purposes of this proposed regulation it includes only the following:</p> <ol style="list-style-type: none"> <li>(1) any straight-shaped fluorescent lamp with a nominal overall length of 1,200 mm (48 inches), a medium bi-pin base and a rated wattage of not less than 25 W;</li> <li>(2) any U-shaped fluorescent lamp with a nominal overall length of not less than 560 mm (22 inches) and not more than 635 mm (25 inches), a medium bi-pin base and a rated wattage of not less than 25 W;</li> <li>(3) any rapid start straight-shaped fluorescent lamp with a nominal overall length of 2,400 mm (96 inches) and a recessed double-contact base;</li> <li>(4) any instant-start straight-shaped fluorescent lamp with a nominal overall length of 2,400 mm (96 inches), a single-pin base and a rated wattage of not less than 52 W;</li> <li>(5) any straight-shaped fluorescent lamp with a nominal overall length not less than 1,125 mm (45 inches) and not greater than 1,200 mm (48 inches), with a miniature bi-pin base (standard output lamps) and a rated wattage of not less than 26 W;</li> <li>(6) any straight-shaped fluorescent lamp with a nominal overall length not less than 1,125 mm (45 inches) and not greater than 1,200 mm (48 inches), with a miniature bi-pin base (high output lamps) and a rated wattage of not less than 49 W; and</li> <li>(7) any fluorescent lamp that is a physical and electrical equivalent of a lamp described in the previous six paragraphs.</li> </ol> <p><b>Not included:</b></p> <ul style="list-style-type: none"> <li>• fluorescent lamps designed to promote plant growth;</li> <li>• fluorescent lamps specifically designed for cold temperature applications;</li> <li>• coloured fluorescent lamps;</li> <li>• fluorescent lamps designed to be impact-resistant;</li> <li>• reflector or aperture lamps;</li> <li>• fluorescent lamps designed for use in reprographic equipment;</li> <li>• fluorescent lamps designed to produce radiation primarily in the ultraviolet region of the spectrum;</li> <li>• lamps with a Colour Rendering Index (CRI) of 87 or greater; and</li> <li>• 700 series T8 lamps (1,200 mm medium bipin, 560 to 635 mm U-shaped, and 2,400 mm slimline and high output).</li> </ul>
<p><b>TEST STANDARD</b></p>	<p>CSA – 819-11 Performance of General Service Fluorescent Lamps</p>

<p><b>PROPOSED ENERGY PERFORMANCE STANDARD</b></p>	<p>CSA – 819-11 Performance of General Service Fluorescent Lamps</p> <p>The efficiency levels of General Service Fluorescent Lamps shall meet the minimum average lamp efficacy levels as set out in Table 1 of CSA C819-11.</p> <p>This standard effectively phases out T12 lamps as well as inefficient T8 lamps.</p> <p><b>Note:</b> <i>The efficiency levels in this standard are fully harmonized with the US Department of Energy (DOE) Final Rule on “Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps” from 2009-07-14 coming into effect on 2012-07-14. [Reference: Federal Register / Vol. 74, No. 133, page 34080 – 34179]. It is furthermore intended to harmonize with the proposed Natural Resources Canada (NRCan) Bulletin on “General Service Fluorescent Lamps, May 2010.</i></p>
<p><b>EFFECTIVE DATE</b></p>	<p>Products manufactured and sold after September 1, 2013.</p>
<p><b>CERTIFICATION</b></p>	<p>CSA certification or certification with any Standards Council of Canada (SCC) accredited certification organization will be sufficient to determine compliance with the regulation.</p> <p>The NRCan <i>Energy Efficiency Regulations</i> currently require that general service fluorescent lamps bear an energy efficiency verification mark, indicating that the energy performance of the product has been verified and complies with the appropriate energy performance standard. An energy performance verification mark must be authorized by a SCC accredited certification body that is recognized for an energy efficiency performance verification program for this product.</p> <p>British Columbia will not require a unique label on products, but rather will defer to the label required by NRCan.</p>
<p><b>NEED FOR REGULATION</b></p>	<p>The proposed regulation supports the target for BC Hydro to meet 66% of electricity demand growth through demand-side measures by 2020, as stated in the <i>Clean Energy Act</i>. If adopted, the new standards would harmonize with the efficiency levels set in the US DOE rulemaking and the proposed NRCan regulation on entry into force.</p> <p>The NRCan regulation, if approved, will only apply to products manufactured outside BC. While this is currently the case, a harmonized BC regulation will prevent non-compliant products from being manufactured in BC for domestic consumption. Since the early 1990’s the federal government and provinces have jointly advanced similar or identical regulations to ensure consistency of standards across Canada.</p> <p>If the NRCan regulation is not approved, British Columbia consumers purchasing light bulbs may be subjected to higher than necessary costs, despite market transformation within the United States.</p>

<p><b>HARMONIZATION</b></p>	<p>The Ministry of Energy and Mines attempts, where appropriate, to harmonize with other regulatory agencies which represent larger markets than BC. The proposed regulation attempts to harmonize with US regulations as outlined in the US DOE's Final Rule published on July 14, 2009.</p> <p>NRCan has indicated a regulatory intent to harmonize with the US DOE rulemaking in a bulletin issued in 2010. The proposed Federal regulation will be part of NRCan's Amendment 13 to the Canadian Federal Government's <i>Energy Efficiency Regulations</i>. A bulletin dated November 2011 confirms NRCan's intent to publish this standard in Amendment 13.</p> <p>The Province of Nova Scotia is considering a Provincial Product Regulation covering General Service Fluorescent Lamps. Efficiency levels will be set to at least the levels proposed by the Federal and British Columbia regulations.</p>
<p><b>TRANSPARENT REGULATION DEVELOPMENT</b></p>	<p>The development of this regulation followed the procedure as outlined below:</p> <ul style="list-style-type: none"> <li>• Identification of a potential standard adopted in other jurisdictions (US DOE rulemaking)</li> <li>• Market analysis including retail and residential survey completed by BC Hydro</li> <li>• Economic assessment</li> <li>• Regulatory assessment</li> <li>• Stakeholder Workshop</li> </ul> <p>The proposed regulation is currently undergoing formal stakeholder consultation. Written responses are invited to this Regulatory Impact Statement within 60 days (by October 30<sup>th</sup>, 2012).</p> <p>Stakeholders consulted to date include:</p> <ul style="list-style-type: none"> <li>• Shelfspace</li> <li>• Retail Council of Canada</li> <li>• Home Hardware</li> <li>• Building Owners and Managers Association</li> <li>• Rental Owners and Managers Society of BC</li> <li>• BC Apartment Owners and Managers Association</li> <li>• Condominium Home Owners Association</li> <li>• Vancouver Island Health Authority</li> <li>• Vancouver Coastal Health</li> <li>• Electrofed</li> <li>• Standard</li> <li>• Quantum</li> <li>• It's On Electric</li> <li>• Nedco</li> </ul>

<b>MARKET TRANSFORMATION STRATEGY</b>	<p>Since 2002, BC Hydro has offered financial incentives through its Power Smart Demand Side Management program to its customers to replace inefficient T12 fluorescent lamps with more efficient fluorescent lighting technologies, such as the T8 fluorescent lamps with energy efficient ballasts. The incentives have been offered under the Power Smart Partners (PSP) program, the Power Smart Express (PSPX) program, the Product Incentive Program (PIP) and the Direct Install (DI) Program. Additionally, the LiveSmart BC Small Business Program has offered a 10% top up to PIP incentives since December 2010.</p> <p>Since the BC regulation on ballasts for fluorescent general service lamps was enacted in 2009, the focus of these Power Smart incentive programs has been on promoting the more efficient lighting technology such as T8 lamps operated by energy-efficient electronic ballasts with a low ballast factor.</p> <p>Currently, BC Hydro’s Power Smart Partner Program and Product Incentive Program offer financial incentives to replace a T12 lamp with an energy efficient T8 lamp. These program offers only incent lighting products that are more efficient than the proposed regulated efficiency level.</p> <p>Residential incentive offers include incentives on ENERGY STAR® fluorescent fixtures (for T8 and other fluorescent lamps that are compliant with the proposed regulation).</p> <p>The uptake in all of the above mentioned incentive programs by BC Hydro customers have been large, resulting in significant energy savings and a substantial increase in market share of the more efficient T-8 lamps that meet the proposed energy efficiency levels (see Market Share under the Assessment from an Industry Perspective).</p> <p>Besides the incentive programs, BC Hydro is planning to support this regulation through additional communication efforts that include workshops and visible marketing efforts aiming at educating BC Hydro customers and training of the lighting trades on the upcoming regulation.</p> <p>In addition to BC Hydro’s market transformation initiatives, FortisBC’s PowerSense has offered a wholesale point of purchase incentive for T8 lamps, ballasts and fixtures since 2009. Similarly, LiveSmart BC and FortisBC have offered the Lighting Installation Program (FLIP) over the past year which has provided turnkey T8 lighting upgrades to businesses.</p>
<b>DEMAND-SIDE MANAGEMENT ATTRIBUTION</b>	<p>This proposed regulation can be promoted by energy utilities through their Demand-Side Management (DSM) programs, leading to increased market share of compliant products prior to the effective date. In turn, part of the energy savings from the proposed regulation can be attributed back to those DSM programs as per Section 4 (Subsection 1.4) of the Demand-Side Measures Regulation under the <i>Utilities Commission Act</i>:</p> <p><a href="http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_326_2008">http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_326_2008</a></p>

<b>RANGE OF PRODUCTS AFFECTED</b>	All standard fluorescent lamps that are commonly used for general service lighting purposes such as T12s, T8s and T5s. These lamps include 4-foot T12s, T8s and T5s, 8-foot T12s and T8s and 2-foot U-shaped T12s and T8s. The exact scope is given above.
<b>COST IMPACT</b>	Replacement energy-efficient general service fluorescent lamps are already widely available and readily available in BC.  Cost assessments for consumers are discussed in the next section of the regulatory impact statement.
<b>COMPETITIVE ANALYSIS</b>	There are no manufacturers of the products covered by this regulation in British Columbia. Marketing and distribution of general service fluorescent lamps is done on a continental basis. With the proposed BC regulations harmonizing with the NRCan and Federal US rulemaking, there is little risk of leakage of inefficient products to neighbouring jurisdictions after adoption of the regulations.
<b>MARKET SHARE</b>	According to a market study for NRCan ( <i>Market Study: General Service Fluorescent Lamps</i> by ICF November 30, 2009), the market share for fluorescent lamps is stable and make up approximately 24% of the overall lamp market in Canada.  In 2003, 64.9% of all fluorescent lamp sales were T12 lamps. In 2010, this number has dropped down to 36.6%. The relative share of T12 lamps sold to the Commercial and Industrial sector was only 25% in 2010. These numbers reflect the impact of incentive programs and other demand-side management activities in the Province of British Columbia.
<b>WASTE MANAGEMENT</b>	These lamps can be safely disposed of at over 160 recycling locations province-wide. Visit The Recycling Council of BC's website for location specific details: <a href="http://rcbc.bc.ca/">http://rcbc.bc.ca/</a>

<p><b>CAPITAL / PURCHASE COSTS</b></p> <p><b>RESIDENTIAL&amp; COMMERCIAL</b></p>	<p>Replacing a set of T12 lamps with T8 lamps will also require the replacement of the lamp ballast. Existing BC provincial regulation already mandates sales of the more energy efficient electronic ballasts, harmonized with the NRCan Fluorescent Lamp Ballasts regulation.</p> <p>Assumptions used in the cost analysis:</p> <ul style="list-style-type: none"> <li>• The life of fluorescent lamps is 6 years</li> <li>• The life of ballasts is 16 years, with an average remaining life of 6 years among all existing products in the province</li> <li>• Incremental cost (based on today’s price differences):             <ul style="list-style-type: none"> <li>○ upgrade of the lamps (two lamps per ballast)</li> <li>○ upgrade of the ballast</li> <li>○ upgrade of the lamp sockets</li> </ul> </li> <li>• A qualified contractor is retained and an electrical permit is acquired to carry out the work. Materials are supplied by the contractor through a wholesale channel.</li> <li>• Given the average remaining ballast life of 6 years, a credit is added to the incremental cost in lieu of the replacement cost in the future (applied to the cost of the ballast, sockets, labour and electrical permit – but not the lamp itself as it is assumed the lamp will only be replaced when it fails).</li> </ul> <p>The resulting incremental cost for the upgrade of lamps, ballast and sockets in the residential and commercial sector is \$6.08.</p>
<p><b>COST-BENEFIT ANALYSIS</b></p> <p><b>ENERGY SAVINGS FOR EACH CONSUMER</b></p> <p><b>RESIDENTIAL</b></p>	<p>The result of the analysis over the life of fluorescent lamps shows that the proposed regulation for general service fluorescent lamps will have a positive financial impact on consumers. Their lower energy bills will outweigh the additional costs associated with purchasing compliant products.</p> <p>The analysis was based on a realistic mix of the two residential electricity rate tiers and typical consumption patterns. The rates reflect the recently approved rate increases over three years for BC Hydro. After that the rate increase is escalated at an assumed inflation rate of 2.1%. All consumer financial analyses are discounted at 8%. The lamps are being operated for approximately 1,000 hours per year as in a typical residential environment.</p> <p>The net present value (NPV) of 15 kWh/year electricity savings is \$0.64. This provides a simple payback on investment of 4.7 years. The simple payback is sooner than the assumed T8 lamp product life of 6 years.</p>

<b>COST-BENEFIT ANALYSIS</b>	The result of the analysis shows that the proposed regulation for general service fluorescent lamps will have a positive financial impact on consumers. Their lower energy bills will outweigh the extra costs associated with purchasing compliant products.
<b>ENERGY SAVINGS FOR EACH CONSUMER</b>	The analysis was based on BC Hydro's Small General Service rate. The rates reflect the recently approved rate increases over three years. After that the rate increase is escalated at an assumed inflation rate of 2.1%. All financial analyses are discounted at 8%. The lamps are being operated for approximately 3,600 hours per year.
<b>COMMERCIAL</b>	The net present value (NPV) of 54 kWh/year electricity savings is \$20.22. This provides a simple payback on investment of 1.1 years. The simple payback is sooner than the assumed T-8 lamp product life of 6 years.

### ASSESSMENT FROM A PROVINCIAL GOVERNMENT PERSPECTIVE

<b>ECONOMIC ASSESSMENT FROM A PROVINCIAL PERSPECTIVE</b>	<p>The economic analysis considers the province-wide impact. Based on data from BC Hydro's draft <i>2012 Integrated Resource Plan</i>, the marginal cost of electricity supply was assumed to be 12.90 cents per kWh in Fiscal 2013, plus 2.1% inflation per year. The product life of general service fluorescent lamps is set at 6 years. The incremental capital cost of products is a weighted average of the costs used in the consumer impact assessment section.</p> <p>The cumulative electricity and cost savings generated by this regulation from the proposed effective date to year 2020 are shown below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #4f81bd; color: white;">Cumulative Electricity Savings to 2020 in GWh/yr and million \$</td> <td style="text-align: center;">177 GWh / \$95.1M</td> </tr> <tr> <td style="background-color: #4f81bd; color: white;">Provincial NPV in million \$</td> <td style="text-align: center;">\$ 38.1M</td> </tr> </table> <p>In summary, the province-wide impact is about \$100 million in savings in 2020 through energy cost reductions, or \$38 million between now and 2020 over and above capital cost increments.</p> <p>The proposed regulation will result in reduction of yearly greenhouse gas (GHG) emissions. The cumulative emissions savings from the proposed effective date to year 2020 are shown below, assuming an emission factor of 28 tonnes per GWh.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #4f81bd; color: white;">Cumulative GHG Savings to 2020 in tonnes</td> <td style="text-align: center;">1,550 t</td> </tr> </table>	Cumulative Electricity Savings to 2020 in GWh/yr and million \$	177 GWh / \$95.1M	Provincial NPV in million \$	\$ 38.1M	Cumulative GHG Savings to 2020 in tonnes	1,550 t
Cumulative Electricity Savings to 2020 in GWh/yr and million \$	177 GWh / \$95.1M						
Provincial NPV in million \$	\$ 38.1M						
Cumulative GHG Savings to 2020 in tonnes	1,550 t						

<b>REGULATORY REQUIREMENTS AVOID OR ELIMINATE DUPLICATION WITH OTHER JURISDICTIONS</b>	The proposed regulation is harmonized with the US DOE rulemaking and the proposed regulation by NRCan.
<b>ADMINISTRATIVE FEASIBILITY FOR COMPLIANCE AND ENFORCEMENT</b>	The compliance and enforcement approach under the <i>Energy Efficiency Act</i> is based on third-party verification and labelling of products as per the NRCan regulation, along with BC specific education of manufacturers, distributors, retailers and consumers with respect to energy efficiency standards and labelling requirements.  No unique BC label will be required.

## NOTES

<b>REGULATORY ASSESSMENT COMPLETED BY</b>	Nat Gosman Tel: 250-953-3391 Email: Nathaniel.Gosman@gov.bc.ca
<b>DATE</b>	August 31 <sup>st</sup> , 2012