

**REGULATORY RESEARCH SUMMARY FOR  
GENERAL SERVICE LIGHTING**

Prepared by:

Energy Efficiency Branch,  
BC Ministry of Energy, Mines and Petroleum Resources

and

BC Hydro Power Smart

November 2008

**Proposed Regulatory Area: General Service Lighting**

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| <p><b>Type of Device</b></p>                       | <p>General Service (“A” type) Incandescent Light Bulbs</p> <p>Note: 200 to 310 lumens (25W) and 2600 to 3000 lumens (150W) bulbs are exempt from the regulation</p> <p><b>Note:</b> Modified spectrum lamps will be subject to the regulation. The government of British Columbia intends to match the Government of Canada’s standards for modified spectrum lamps. The final provincial regulation will reflect the approved federal standard, once it is announced by Natural Resources Canada.</p>  |
| <p><b>Test Standard</b></p>                        | <p>IESNA LM45 (IES standard IES-LM-450-00, entitled <i>IESNA Approved Method for Electrical and Photometric Measurements of General Service Incandescent Filament Lamps</i>) for lamp lumen output and wattage</p> <p>IESNA LM49 (IES Standard IES-LM-49-01, entitled <i>IESNA Approved Method for Life Testing of General Lighting Incandescent Filament Lamps</i>) for lamp life</p> <p>CIE 13.3 (CIE Publication No. 13-3, <i>Method of Measuring and Specifying Color Rendering Properties of Light Source</i>, 1995) for lamp colour-rendering index (CRI)</p> |
| <p><b>Current BC Regulation</b></p>                | <p>No current performance requirement for general service lighting in the current Energy Efficiency Standards Regulation</p>  |
| <p><b>Proposed Energy Performance Standard</b></p> | <p>The minimum lumen efficacy factor for this regulation is:</p> <p>Lamp Efficacy <math>\geq 4.0357 \times \ln(\text{lumen}) - 7.1345</math> Lumens per Watt (LPW)</p>  |

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| <b>Effective Date</b>                  | <p>250 to 749 lumens (40W) – December 31, 2012</p> <p>750 to 1049 lumens (60W) - December 31, 2012</p> <p>1050 to 1489 lumens (75W) - January 1, 2011</p> <p>1490 to 2600 lumens (100W) - January 1, 2011</p>   |
| <b>Certification</b>                   | <p>IES LM 45 and IES LM49 measured at 120 volts</p> <p>Natural Resources Canada to finalize verification standards for general service lighting by 2010 in collaboration with the Canadian Standards Association (CSA). British Columbia intends to amend the provincial regulation to match the federal verification standards, once they are finalized.</p> |
| <b>Need for the Regulation</b>         | <p>New regulation supports the policies and targets of <i>The BC Energy Plan: A Vision for Clean Energy Leadership</i> and the <i>Energy Efficient Buildings Strategy: More Action, Less Energy</i>, and positions BC as a leading jurisdiction in North America on energy efficiency standards for general service lighting.</p>                             |
| <b>Results Based Regulatory Design</b> | <p>Regulation is based on energy performance (lumens per watt), resulting in tangible electricity savings for all consumers.</p>  |

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| <p><b>Transparent Regulation Development</b><br/>(Acceptability)</p> | <p>Development of regulation involved the following procedure:</p> <ul style="list-style-type: none"> <li>• Identified a potential standard</li> <li>• Identified test procedure</li> <li>• Market analysis</li> <li>• Economic assessment</li> <li>• Regulatory assessment</li> <li>• Consultation workshops – targeted outreach to Manufacturers/Distributors (October 24, 2008), Consumers and end-users (November 3, 2008)</li> <li>• Formal stakeholder consultation, with written responses to regulatory impact statement (Nov-Dec 2008)</li> </ul>  |
| <p><b>Market Transformation Strategy</b></p>                         | <p><b>BC Hydro Power Smart Programs</b></p> <p>March 2002 -August 2004, Energy Star Lighting Program, Phase 1 (free CFL giveaway campaign at retail level)</p> <p>October- December 2004, September-December 2005, Energy Star Lighting Program Phase 2 (a two-tier lighting rebate campaign that featured seasonal LED lights (SLEDs), compact fluorescent torcheires (CFTs) and CFLs)</p> <p>October 2006-April 2007, Energy Star Lighting Program, Phase 3 (a two-tier retail (silver and gold) campaign that featured Energy Star fixtures and CFLs.)</p> <ul style="list-style-type: none"> <li>• As of 2007, 85% of BC households have at least one compact fluorescent lamp (CFL) and the average number of CFL’s per household is 8 (the average household has approximately 36 lamps in total).</li> </ul> |

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| <p><b>Market Transformation Strategy (cont)</b></p> | <p><b>FortisBC PowerSense Programs</b></p> <p><u>Residential</u><br/> PowerSense has provided incentives for CFLs since the early 90's,. The current CFL rebate is a \$5 mail-in coupon (per CFL), up to ½ the purchase cost. From January to October 2008, PowerSense paid an “average” rebate of \$2.09 per CFL on approximately 24,000 lamps. The rebate coupons are available on store shelves at retail outlets (Home Hardware, Cdn Tire etc.), included periodically with customer billing mail-out and in PDF format on the FortisBC website:</p> <p>Under the residential New Home program, PowerSense offers a free sample pack of ten CFLs which are a variety of CFL types (reflector, 3-way, bug light and regular “twister” styles).</p> <p><u>Commercial:</u><br/> Custom Option: used for hard-wired CFL fixtures.<br/> The custom option rebate is the lesser of:<br/> a. 5 cents per annual kWh saved (e.g. 200 kWh/yr = \$10.00)<br/> b. ½ the installed cost (retrofit) or 100% of incremental cost (new installations)<br/> c. Amount necessary to achieve a two-year payback.</p> <p><b>Conclusion</b><br/> Based on BC Hydro market research, in the absence of federal or provincial regulation, CFLs and other compliant alternatives (e.g., infrared halogen) are expected to make up 60% of residential lamps installed in BC in 2012.</p> |
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**Assessment from a Consumer Perspective**

| <b>Criteria</b>                 | <b>Evaluation</b>   |
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| <b>Capital / purchase costs</b> | <p>CFL prices have fallen significantly in recent years. Many varieties of CFLs are now available for as little as \$2 a bulb, including quality products from major national and international manufacturers</p> <p>In a household with 36 bulbs, switching from incandescent to Energy Star fluorescent bulbs will cost an extra \$35 per year.</p> |

**Cost-Benefit Analysis**

**Energy savings for each consumer**

(Affordability)

Energy Star testing indicates that CFLs last up to 10 times longer than standard incandescent bulbs and use one-third the electricity to produce the same amount of light as conventional bulbs.

Energy Star testing indicates that CFLs last on average 10 times longer than standard incandescent bulbs and use one-third the electricity to produce the same amount of light as conventional bulbs.

The electricity savings per household is estimated at 1,600 kWh per year, assuming 36 lamps per household.

The financial value for consumers is positive across all lumens and wattage levels, even when breakage and heat loss effects (from incandescent to CFL) are taken into account. It also remains positive when the discount rate, energy savings, energy prices, usage, capital cost, and lifespan are varied. See Appendix 1 for a full analysis of the Net Present Value and sensitivities.

**Residential**

|                  | Net Present Value | Simple Payback Time (yrs) |
|------------------|-------------------|---------------------------|
| 40W replacement  | \$5.45            | 2.0                       |
| 60W replacement  | \$9.14            | 1.7                       |
| 75W replacement  | \$10.50           | 1.7                       |
| 100W replacement | \$15.70           | 1.4                       |

**Commercial**

|                  | Net Present Value | Simple Payback Time (yrs) |
|------------------|-------------------|---------------------------|
| 40W replacement  | \$14.57           | 1.2                       |
| 60W replacement  | \$22.83           | 1.0                       |
| 75W replacement  | \$26.42           | 1.0                       |
| 100W replacement | \$37.12           | 0.8                       |

Other alternatives such Halogen Infra-Red (HIR) bulbs are being introduced to market in 2008, and their price will decrease as availability expands.

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| <p><b>Consumer choice / quality of service</b><br/>(Availability)</p> | <p>CFLs are available in all regions of British Columbia, and are sold in major retail outlets such as Home Hardware, London Drugs, Safeway, Thrifty's, Costco, Wal-Mart, Home Depot, Rona, Save-on-Foods, Zellers, Overwaitea Food Group, Shoppers Drug Mart, etc. More specialized applications such as dimmable bulbs and chandeliers have more limited distribution, but are still available for shipping from central outlets.</p> <p>According to recent market research from BC Hydro, consumers are satisfied with the performance of CFLs in their homes. When asked for reasons why they were replacing their CFLs, only 2% of BC residents surveyed said they dissatisfied with the performance of the bulbs. The vast majority were replacing their CFLs because they burned out.</p> |
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## Assessment from an Industry Perspective

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| <b>Range of products affected</b> | 40W,60W, 75W, 100W incandescent bulbs<br>(main application is to General Service “A” type bulbs, 110-130V with E26 medium screw base)   |
| <b>Cost impacts</b>               | For most product categories, there is no cost impact to industry as compliant products are already being manufactured and sold in the BC market.  |
| <b>Competitive Analysis</b>       | There are no manufacturers in BC.   |
| <b>Market Share</b>               | <p>According to the residential customer survey, approximately three out of five households purchased CFLs in 2007/2008. Approximately 7.3 million CFLs were sold in British Columbia during this year. CFLs incidence and penetration rate in British Columbia households reached 8 and 85%, respectively, and have experienced steady increase over the preceding years</p> <p>Baseline research conducted in 2003 found that 18% of small business customers had installed CFLs and this rate rose to 28% by 2005. Among small businesses which were using CFLs in 2005, the average number of CFLs installed was between 5 and 6 per establishment.</p> |



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| <p><b>Waste Management</b></p> | <p>Major retailers such as Home Depot and IKEA have already implemented a recycling program while many other major retailers, have such as Wal-Mart, RONA, and London Drugs, are implementing recycling programs for compact fluorescent bulbs. In most BC communities, there is at least one location to drop off burned out CFLs for recycling at no cost.</p> <p>On April 24, 2008, the government of British Columbia announced it intends to add mercury-containing products such as light bulbs to the provincial Recycling Regulation</p> <p>Under B.C.'s Recycling Regulation, industry is responsible for collecting and recycling any regulated products it manufactures or sells. It is expected that manufacturers will develop and implement their own product stewardship plans to comply with the latest additions to the regulation. These plans should be ready for public consultation and further development in 2009.</p> |
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**Assessment from a Provincial Government Perspective**

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| <p><b>Economic assessment from a provincial perspective</b><br/>(Aggregate energy, emission and net cost savings)</p> | <p>Yearly electricity savings from reg: 2,700 GWh/yr, equivalent to the total electricity consumption of 257,000 households.<br/>Yearly GHG savings in 2016 (before electricity becomes carbon neutral): 143,000 tonnes.<br/>Yearly financial savings: \$298 million<br/>Net present value: \$2.2 billion</p> |
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| <p><b>Regulatory Requirements Avoid or Eliminate Duplication with Other Jurisdictions</b></p> | <p>Proposed regulation is generally harmonized with proposed federal regulations to phase out inefficient incandescent light bulbs by 2012. For some product lines, the provincial timelines are different due to BC's more mature market for CFLs and to address recent stakeholder feedback on the draft federal standards.</p> <p>The proposed BC regulation would implement the 75W and 100W standards a year earlier than the proposed federal standard, implement the 60W standard a year later, and exempt 25W and 150W bulbs (covered by the proposed federal regulation) due to their small market share.</p> <p>The US, California are implementing similar standards, within 2-3 years of the BC standard coming into effect (see Table 1 below for BC, Canada and CA timelines)</p> |
| <p><b>Administrative Feasibility for Compliance and Enforcement</b></p>                       | <p>Compliance and enforcement approach under the <i>Energy Efficiency Act</i> is based on third-party verification, labelling of products and education of manufacturers, distributors, retailers and consumers with respect to energy efficiency standards and labelling requirements.</p> <p>An integrated provincial/utility/industry strategy to promote compliance with the new regulation will be developed and implemented, once Cabinet has made a decision on the proposed regulation.</p>   |

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| <p><b>Regulatory Assessment Completed by</b></p> | <p>Erik Kaye<br/>Senior Policy Advisor, Energy Efficiency<br/>Ministry of Energy, Mines &amp; Petroleum Resources<br/>(250) 356-1507</p> |
| <p><b>Date</b></p>                               | <p>November 18, 2008</p>   |

**Table 1. Timelines for proposed federal and provincial regulations for general service lighting**

**Note: Applies to General Service “A” type bulbs, 110-130V with E26 medium screw base**

| <b>Wattage of targeted incandescent bulbs</b> | <b>Lumens (range captured)</b> | <b>NRCAN proposed effective dates</b> | <b>Province of BC proposed effective dates</b> | <b>California proposed effective dates</b> |
|---|--------------------------------|---------------------------------------|--|--|
| 25W   | 200-310 lm                     | December 31, 2012                     | Exempt   | January 1, 2013                            |
| 40W   | 310-749 lm                     | December 31, 2012                     | December 31, 2012                              | January 1, 2013                            |
| 60W   | 750-1049 lm                    | January 1, 2012                       | December 31, 2012                              | January 1, 2012                            |
| 75W   | 1,050-1,489 lm                 | January 1, 2012                       | January 1, 2011                                | January 1, 2012                            |
| 100W  | 1,490-2,600 lm                 | January 1, 2012                       | January 1, 2011                                | January 1, 2011                            |
| 150 W   | 2,600-3,000 lm                 | January 1, 2012                       | Exempt   | Exempt                                     |

## **2. Questions and Answers**

**Q: Is the regulation cost effective from a consumer and societal perspective?**

**A:** Yes. Analysis conducted by MEMPR, BC Hydro and NRCAN confirm even under the most conservative scenarios product alternatives to incandescent bulbs are cost-effective from both a consumer and societal perspective. MEMPR’s economic analyses and the NRCAN regulatory impact statement are attached as appendices to the report, and take into account issues such as increased heating costs resulting from replacing incandescent lamps with compact fluorescent lamps.

**Q: Will businesses pay more under this regulation? Aren’t CFLs more expensive than regular bulbs?**

**A:** This regulation will generate substantial cost-savings for BC businesses. Federal research suggests that CFLs last on average 10 times longer than standard incandescent bulbs and use one-third the electricity to produce the same amount of light as conventional bulbs.

Some varieties of CFLs are now available for as little as \$2 a bulb, and the combination of energy savings and long life means CFLs will pay for themselves many times over.

For example, a small business with twenty-five 60 W lights would save \$570 by replacing them with CFLs

**Q: To what extent will the proposed regulation limit consumer choice?**

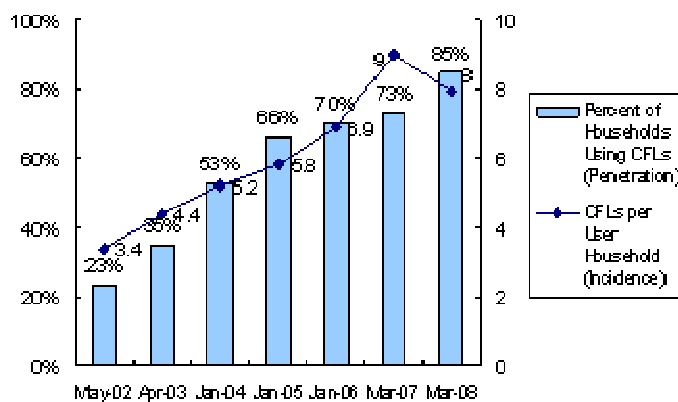
A: The incremental effect on consumer choice from this proposed regulation will be minor, as British Columbia is largely matching the proposed federal regulations. One of the remaining two product types that are being introduced in advance of NRCAN regulations is harmonized with proposed timing for California standards. Replacement products for 75 Watt incandescent bulbs will be introduced one year in advance of California and NRCAN standards.

The Ministry has consulted stakeholders on the implementation of standards targeting 75W and 100W incandescent bulbs one year earlier than NRCAN. The sessions indicated a broad consensus in favour of proceeding with this regulation. Both industry and consumer stakeholders were confident the regulation would not have a significant impact on product availability and consumer choice.

BC has one of the highest adoption rates of CFL bulbs in Canada. Statistics Canada data indicates that BC was the only province to have over 60% penetration of CFLs in 2006, nearly 10% above the Canadian average for that year.

According to the residential customer survey, approximately three out of five households purchased CFLs in 2007-08. Approximately 7.3 million CFLs were sold to residential households in British Columbia during this time period. CFL incidence and penetration rate in British Columbia households reached 8 and 85%, respectively, and have experienced steady increase over the past years, as shown in Figure 1.

**Figure 1: CFL Household Penetration and Incidence Rate in British Columbia**



Source: Residential Customer Survey F2007 and BC Hydro Power Smart CFLs Program Evaluation Reports, 2002-2007

In addition to CFLs, Halogen Infrared (HIR) bulbs also meet the standards of the proposed regulation, and industry participants expect HIR bulbs to be more widely available in BC over the coming years. Light-emitting diode (LED) bulbs are also approved under the proposed regulation, but are mainly applicable to the lower wattage levels.

**Q: Will the alternative products maintain quality and performance standards?**

A: The main product alternative – Compact Fluorescent Lamps (CFLs) – has been continually improving since first arriving on the North American market in the early 1980's., and CFLs are widely used in British Columbia homes and businesses today.

To ensure quality results, consumers can look for the ENERGY STAR label when purchasing CFL products. ENERGY STAR tests and evaluates CFLs to high standards of efficiency, life and light output.

Market studies indicate that some consumers remain concerned about performance of CFLs in specific contexts, such as dimmers or to light a particular colour or object in the room. Different standards for modified spectrum lamps and alternative compliant products, such as HIRs, will help address those concerns. However, there are some incandescent light functions, such as dimming, which cannot be duplicated 100% by CFLs due to inherent technical differences in the two products, and consumers will be informed by those differences in their future purchasing decisions.

**Q: Are British Columbians satisfied with the performance of CFLs?**

A: According to recent market research from BC Hydro, consumers are satisfied with the performance of CFLs in their homes. When asked why they were replacing their CFLs, only 2% of BC residents surveyed said they were not happy with the performance of the bulbs. The vast majority were replacing their CFLs because they burned out.

**Q: Why is the BC government moving ahead of the Canadian regulations? Why not just wait until 2012 for the federal standards to apply to BC?**

A: Implementing the 75-100 watt standards (1,050 to 2,600 lumens) a year earlier in BC will help to gradually introduce the federal standards to the BC market and give industry and consumers more time to adjust. The proposed standard will demonstrate leadership on energy efficiency and help meet the aggressive 50% conservation target for BC Hydro, as set out in the BC Energy Plan: A Vision for Clean Energy Leadership.

**Q: What are the electrical energy, peak demand and greenhouse gas impacts of the proposed regulation?**

A: Yearly electricity savings: 2,700 GWh/yr

Cumulative electricity savings from 2011 to 2020: 37,500 GWh

Yearly GHG savings in 2016 (before electricity becomes carbon neutral): 143,000 tonnes.

Cumulative GHG reductions from 2011 to 2016: 624,000 tonnes

**3. MARKET STUDY – BC Hydro**

**Current Market Penetration**

BC Hydro undertakes comprehensive end use surveys of residential customers every two years, as well as annual surveys of purchases and saturation of selected lighting products. Table 3.1 provides estimates of the number of lamps installed in BC Hydro’s service territory from 1997 through 2006. There has been a substantial increase in the number of lamps installed in residential dwellings over the ten years examined, with the total reaching about 53 million lamps in 2006. The number of lamps installed is mainly a function of the number, type and size of residential dwellings. A key feature of the data is the increase in the number of CFLs installed, which increased from less than one-half million in 1997 to 10.6 million in 2006. In 2006, CFLs occupied about one-fifth of residential lighting points.

**Table 3.1. Residential Lamps Installed, BCH Service Territory, 1997-2006 (million)**

| <b>Year</b> | <b>Incandescent</b> | <b>Fluorescent</b> | <b>CFL</b> | <b>Halogen</b> | <b>Other</b> | <b>Total</b> |
|-------------|---------------------|--------------------|------------|----------------|--------------|--------------|
| 1997        | 35.2                | 4.3                | 0.4        | 2.2            | 1.9          | 44.0         |
| 1998        | 36.1                | 4.5                | 0.6        | 2.6            | 2.2          | 46.0         |
| 1999        | 36.7                | 4.6                | 0.7        | 3.1            | 2.1          | 47.2         |
| 2000        | 37.2                | 4.9                | 1.0        | 3.4            | 2.1          | 48.6         |
| 2001        | 36.1                | 5.1                | 2.7        | 3.4            | 2.4          | 49.7         |
| 2002        | 35.1                | 5.0                | 4.9        | 3.9            | 2.2          | 50.9         |
| 2003        | 34.0                | 5.0                | 6.4        | 3.9            | 1.9          | 51.2         |
| 2004        | 35.5                | 5.0                | 7.7        | 4.3            | 2.1          | 54.6         |
| 2005        | 33.6                | 4.8                | 8.7        | 4.4            | 2.0          | 53.5         |
| 2006        | 31.4                | 4.7                | 10.6       | 4.3            | 2.1          | 53.1         |

Sources. BC Hydro, Residential End Use Surveys, various years; BC Hydro, Advertising Tracking, various years; BC Hydro Electricity Load Forecast 2006/07.

## Expected Market Penetration to 2012

Using trends in lamps installed per residential dwelling by lamp type and the forecast number of residential accounts, a forecast of residential lamps installed was made as shown in Table 3.2. In the absence of new federal or provincial legislation regulating lamp efficacy, it is forecast that residential dwellings will have 33.4 million incandescent lamps, 5.6 million linear fluorescent lamps, 14.6 million CFLs, 5.2 million halogen lamps and 2.5 million other lamps installed in 2012. Based on the table below, with no federal and provincial regulation, approximately one third of lamps installed in 2011 would be compliant with the regulation.

**Table 3.2. Forecast Residential Lamps Installed, BCH Service Territory, 2007-2012 (million)**

| <b>Year</b> | <b>Incandescent</b> | <b>Fluorescent</b> | <b>CFL</b> | <b>Halogen</b> | <b>Other</b> | <b>Total</b> |
|-------------|---------------------|--------------------|------------|----------------|--------------|--------------|
| 2007*       | 31.4                | 4.9                | 11.5       | 4.5            | 2.1          | 54.4         |
| 2008*       | 31.5                | 5.1                | 12.6       | 4.6            | 2.2          | 56.0         |
| 2009*       | 31.8                | 5.3                | 13.0       | 4.7            | 2.4          | 57.2         |
| 2010*       | 32.2                | 5.3                | 13.5       | 4.9            | 2.4          | 58.3         |
| 2011*       | 33.1                | 5.5                | 14.1       | 5.1            | 2.5          | 60.3         |
| 2012*       | 33.4                | 5.6                | 14.6       | 5.2            | 2.5          | 61.3         |

Sources. BC Hydro, Residential End Use Surveys, various years; BC Hydro, Advertising Tracking, various years; BC Hydro Electricity Load Forecast 2006/07.

## **Market Transformation for the Residential Sector – BC Hydro**

### History of the Energy Star Lighting Program.

From March of 2002 to August of 2004, Residential Power Smart commenced the first phase of its Energy Star Lighting Program - a free CFL giveaway campaign at retail designed to introduce customers to CFLs and educate them on the benefits of this relatively new technology.

From October to December of 2004 and again from September to December of 2005 BC Hydro launched a second phase of its Energy Star Lighting Program – a two-tier lighting rebate campaign that featured seasonal LED lights (SLEDs), compact fluorescent torchieres (CFTs) and CFLs. Mail-in rebate coupons were made to available to BC residents at shelf level and through BC Hydro’s Internet site. To augment this initiative (i.e. create media excitement and deliver a more tangible component), Power Smart Outreach Teams hosted lighting exchange events at select retailers. At the events, customers received higher value in-store coupons towards the purchase of these products by trading in in-efficient lighting products.

From October 2006 to April 2007 BC Hydro launched a third phase of its Energy Star Lighting Program – a two-tier retail (silver and gold) campaign that featured Energy Star fixtures and CFLs. Participating retailers are classified as either silver or gold based on their level of support for the program. At silver retailers mail-in rebate coupons were available towards the purchase of Energy Star fixtures and CFLs. At gold retailers Power Smart Outreach hosted in-store lighting events featuring higher value instant rebates towards the purchase of Energy Star fixtures and CFLs.

Through its three phases completed to date, this program has saved 351 GWh/yr of electricity. More than 50% of BC Hydro’s residential customers have participated in the Energy Star Lighting Program and many other customers benefited indirectly through reduced market barriers. To date, all phases of this program have relied solely on retail outlets as a distribution point for promotional products and coupons. This approach has resulted in considerable strides towards transforming the residential lighting market, as lighting retailers now carry significantly more Energy Star CFLs and fixtures at lower prices than they did prior to the start of the Energy Star lighting program.

The current program (Phase 4) began June 2007 and includes incentives on both Energy Star fixtures and CFL’s. CFL bulb incentives are focused on specialty CFLs (A-shape, globe, dimmable, candle shape, spiral, flood/reflector). Price levels on standard CFL (spiral) bulbs have dropped substantially over the last few years. This reduction along with increased market acceptance of these standard type bulbs eliminates the need for BC Hydro to provide incentives in the market. Energy Star fixture incentives are typically targeted at common fixture type applications including ceiling mounts, desk lamps,



torchieres, outdoor security and coach lights and ceiling fan lights. Discounts on CFL bulbs and fixtures are applied immediately at cashier with no use of coupons or mail in rebates.

During the months of October and November 2008, BC Hydro rolled out the fall component of the campaign. There is wide accessibility for British Columbians to take advantage of the incentives as BC Hydro has partnered with 412 retail locations province wide including: Home Depot, Rona, Wal-Mart, Overwaitea Food Group, Save On Food Cooper's, Price Smart, Home Hardware, Thrifty's, Illuminations, Costco, Zeller's, London Drugs, Shoppers Drug Mart, and Safeway.

## **Market Transformation – Program Efforts for the Commercial Sector – BC Hydro**

### *Past & Present Efforts*

BC Hydro has been very active in the Commercial marketplace in order to advance market transformation since the inception of Power Smart. Market transformation is necessary for long term sustained electricity conservation. By changing customer buying habits and perceptions, supply chain behaviour, and pricing, efficient technologies become mainstream.

To address the Commercial sector, Power Smart originally launched the Energy Efficient Lighting Program and the Building Improvement Program in 1989. These programs were targeted to all commercial customers including small and medium business (SMB) customers. Both programs were discontinued in 1996. From 1997 to 2003, there were no incentive-based DSM programs for this market from Power Smart.

Power Smart (PS) was relaunched in 2002 with a greater focus on conserving energy and instilling a conservation ethic in British Columbians. In 2003, the comprehensive *Conservation Potential Review* (CPR) (BC Hydro, 2002) identified a significant opportunity for energy savings within the Commercial sector. In response, PS developed and launched a number of programs including the **Power Smart Partner Program** for large commercial customers in April 2002 and the **Product Incentive Program** for all business customers but with a focus on SMB customers in November 2003. In addition, PS implemented a **Small Business Compact Fluorescent Lighting** campaign in 2004 and 2005 targeting Vancouver Island, and the Northern and Southern BC regions. To ensure the integrity of the programs and the technologies installed at a customer site, the **Power Smart Alliance** was established. The Power Smart Alliance is a network of independent contractors and engineers that can help customers select, install and maintain all your facility's energy related systems.

The key objective of these programs and initiatives is to obtain energy savings through the replacement of inefficient technologies with energy efficient products while influencing market transformation to occur. The technologies promoted and targeted for replacement by both programs include but not limited to lighting, HVAC, controls,

computer management and refrigeration. To date, the programs have seen the greatest uptake and energy savings through lighting in particular CFLs, T8s, and other lighting.

The **Power Smart Partner Program (PSP)** is the flagship demand side management program for BC Hydro's top commercial and government customers. PSP is based on a partnering approach with BC Hydro's top business customers. PSP's chief objective is to encourage customers to integrate energy efficiency into their on-going business practices. A customer that commits to being a Power Smart Partner gains access to financial support as well as assistance to identify and implement electricity savings. Specific components of the program include funds to help identify energy saving opportunities, hire an energy manager ("ESO") and implement cost-effective projects (Incentive Funding), education & training, and recognition. The financial resources provided by PS have allowed customers to meet their hurdle rates and more readily implement energy efficiency projects.

The **Product Incentive Program (PIP)** offers prescriptive incentives for commercial customers to retrofit inefficient technologies with energy efficient products. To support this offer, PIP uses a number of tactics including site walkthroughs to help customers identify energy savings opportunities within their business and energy efficiency information and education for customers through seminars, direct mail, web information and other tools.

Since the inception of PIP, CFLs have been one of the leading lighting technologies implemented.

**PIP Metrics**

| <b>Quantity CFL</b> | <b>Incentive Issued (\$)</b> | <b>Estimated Savings (GWh/yr)</b> |
|---------------------|------------------------------|-----------------------------------|
| 77,541              | 258,316                      | 17                                |

Through program marketing efforts, the greatest uptake for CFLs has been is with hotels (guest rooms and hallways) and residential stratas (hallways), many of which use 75-100W bulbs as their principal lighting choice.

The **Small Business Compact Fluorescent Lighting (SB-CFL)** campaign was delivered in two phases in 2004 and 2005. The goal of the initiative was to encourage the adoption of CFL bulbs in the workplace and help customers reduce their energy consumption. The SB-CFL campaign distributed a direct mail piece to customers to provide educational information and a voucher. Customers would redeem the vouchers at one of the participating retailers or distributors for 2 free CFL bulbs (Energy Star<sup>TM</sup> approved and labelled CFL lamps). The initiative achieved 4.8 GWh/year in energy savings.

The **Power Smart Alliance (PSA)** is a critical sales force for targeting the Commercial market. PSA members are already active supporters of the current PSP and PIP programs. In addition to assisting customers install energy efficient equipment, they also provide technical advice and education on the best energy efficient products. In support of the PSA and ensure program criteria is met, **e.Catalog** an on-line database provides

over 8,000 energy-efficient products from over 150 brands in one location. Customers and industry can learn about energy-efficient products screened by BC Hydro's standards for energy efficiency including CFLs, and this information will help commercial customers adjust to the new general service lighting regulations, if approved.

#### **4. OTHER JURISDICTIONS**

##### **US Department of Energy**

On December 19, 2007, President George W. Bush signed H.R. 6, the Energy Independence and Security Act of 2007, into law (Public Law 110-140).

##### *Section 321 – Efficient Light Bulbs*

This provision set, for the first time, efficiency standard for “general service” light bulbs that will essentially phase-out the most common incandescent light bulbs by 2012-2014. The regulation is not a product “ban”, but a performance requirement for wattage, lumen output and life

EISA Timeline for General Service Lighting:

1490 – 2600 lumens– Jan 1, 2012

1050 - 1489 lumens – Jan 1, 2013

750 - 1049 lumens – Jan 1, 2014

310 - 749 lumens – Jan 1, 2014

##### **California**

Since 1975, Section 25402 9(c) of the Public Resources Code has required the California Energy Commission to adopt standards for the energy efficiency of appliances that are feasible, attainable and do not result in any added total consumer costs over the lifetime of the appliance. Total added cost is determined by comparing the cost and the performance of a typical model given the proposed standard to the costs and performance of a typical model without the standard.

On December 15, 2004 the Commission adopted amendments to the Appliance Efficiency Regulations containing two proposals (Alternative 1 and Alternative 2) pertaining to energy efficiency standards for general service incandescent lamps, incandescent reflector lamps and metal halide luminaries. The standards for Alternative 1 are currently under development.

California timeline for General Service Lighting regulation – identical to the US standard under EISA (see previous section) but California is authorized to implement the standards one year earlier than the EISA timelines.

## 5. COMPLIANCE AND ENFORCEMENT

The Ministry of Energy, Mines and Petroleum Resources is developing a compliance and enforcement framework for all products and appliances covered under the *Energy Efficiency Act*. The Ministry's approach to compliance and enforcement is based on third-party certification and labelling based on testing of the lumens per watt for the lighting products covered under this regulation. The labelling indicates that products are compliant with the regulation. These third party certification organizations are recognized by the Standards Council of Canada and have their own procedures for enforcing the use of their labels.

The first step toward fulfilling compliance to the regulation is to ensure broad public awareness about the general service lighting standards and how to read the new labels to ensure the product is both compliant and suited to the needs of the consumer. This awareness could include extensive mail-outs through utility bills, signs with major consumers and internet based materials.

Secondly, we would like to encourage consumers and industry participants to identify and report non-compliance. Finally, further enforcement measures are under development by Ministry staff. The compliance and enforcement framework is still in the developmental stages and the Ministry welcomes suggestions on how to best ensure compliance, while promoting a thriving and competitive lighting sector in the province.