

BC FLUORESCENT LAMPS STEWARDSHIP PLAN

for the period commencing July 1, 2010

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Executive Summary

This stewardship plan for **residential use fluorescent lamps** has been prepared pursuant to the requirements of the BC Recycling Regulation. A preliminary version was used in consulting with stakeholders and the plan has been revised following the consultation process. Consultation themes have been summarized and are included in the plan.

A stewardship agency will implement and manage the plan. The program will be funded by its members.

The stewardship agency will establish and operate a collection system across BC to collect the end-of-life program products. Collected program products will be consolidated and transported to facilities for recycling and other management options. The program will include measures for environmental risk reduction.

The program plan includes a communication and education program to ensure public awareness of the program and to inform consumers how to properly handle fluorescent lamps.

This plan anticipates a launch of July 1, 2010 and proposes actions and targets for five years through to June 30, 2015.

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1. Introduction – Background and Consultation Process

This stewardship plan for **residential use fluorescent lamps** has been developed by Electrical Equipment Manufacturers Association of Canada (EEMAC), an industry council of Electro Federation of Canada. EEMAC has appointed Product Care Association as the program manager.

The program plan has been developed pursuant to the requirements of Recycling Regulation B.C. Reg. 449/2004 (the “Regulation”).

This plan anticipates a launch of July 1, 2010 and proposes actions and targets for five years through to June 30, 2015. Consultation on the plan was conducted in September 2009 and the plan will be submitted to the BC Ministry of Environment for approval before January 1, 2010.

A preliminary program plan was used in consulting with stakeholders and the plan was revised following the consultation.

Following approval of the program plan by the BC Ministry of the Environment, program plan implementation will begin, including:

- identification and qualification of collection sites, transporters and processors
- creation of the communication strategy
- registration of Producers
- budget development, cost analysis and funding mechanism

2. Program Products

This program covers fluorescent lamps¹ marketed to residential users that are designed to be removed by the user. As a result of consultation, it became apparent that there is a need for a program for lamps sold to the ICI sector as well, but that this has different needs and will require a separate process. That additional plan will be submitted by October 1, 2011.

Fluorescent lamps are a low-pressure mercury electric-discharge source in which a phosphor powder transforms ultraviolet energy generated by the mercury discharge into visible light.

There are two categories of fluorescent lamps generally used for residential lighting:

- **Compact fluorescent lights** (CFLs), which fit into standard lighting sockets. CFLs are manufactured in a number of different shapes and a range of light output values.

¹ Note: the term “lamps” is used by the manufacturers to describe what consumers call “light bulbs”.

- **Fluorescent tubes**, (such as T12 Fluorescent Lamps, T8s, T5s, shaped or curved tubes) which require dedicated pin-type sockets. Fluorescent tubes come in different lengths, diameters, and light output. Most are straight but some are curved or shaped.

3. The Fluorescent Lamps Stewardship Agency

A non-profit organization will operate the program on behalf of the program members. Members of the proposed stewardship agency will be Producers² of the Program Products.³ The program members may be manufacturers, distributors and retailers depending upon who is obligated under the Recycling Regulation.

The founding members of the proposed stewardship agency are listed in Appendix A. Program membership will be open to all obligated Producers. Each of the members will appoint the proposed stewardship agency as authorized agent pursuant to s. 2(2) of the Regulation.⁴

4. Current Market and End of Life Management

4.1 Sales & Market

Fluorescent lamps are produced by a number of manufacturers in the world, designed for the North American market and technical requirements (voltages and fixture types). The majority of the supply is distributed by manufacturers to distributors and then to the residential market through retailers. Lamps are also imported directly by distributors and some large retailers.

Fluorescent tubes are a mature technology and sales are expected to continue to be relatively constant.

There has been tremendous growth of the CFL market in recent years. In British Columbia, the use of CFLs for residential lighting has been extensively promoted by electrical utilities for energy efficiency. After a period of rapid growth, CFL sales declined in 2008, indicating that the market for residential CFLs is stabilizing. However, it is difficult to forecast the rate of replacement of fluorescent lamps because of the increasing lifespan of the CFLs. See Table 4.1 below.

² Producers is defined in Appendix G

³ Program Products as defined in Section 2

⁴ British Columbia Ministry of Environment (2006). *BC Recycling Regulation*. Accessed at http://www.bclaws.ca/Recon/document/freeside/-- E --/Environmental Management Act_SBC 2003_c. 53/05_Regulations/43_449_2004_Recycling_Regulation/449_2004.xml.

Table 4.1 BC Residential Market Sales Data for Fluorescent Lamps 2003 -2008 in units (000's)⁵

	2003	2004	2005	2006	2007	2008	Forecast
CFL	1253	760	1610	1626	3713	3110	stable
Fluorescent Tubes	1249	1339	1245	1214	1166	1128	stable

4.2 Available for Collection

The estimation of the number of lamps available for collection in a future year requires data on both the number and lifespan of lamps sold in prior years.

For the purpose of estimating the number of fluorescent lamps available for collection by the program each year, it is assumed at the end of the life of the product substantially all fluorescent lamps sold will be available for collection and will not be stored or reused.

The number of lamps available for collection in a given year will depend on the lifespan of the lamps when sold. The lifespan of a fluorescent bulb depends on a number of factors including bulb quality and technology, the usage location (e.g. lamps used in recessed fixtures may have a shorter lifespan) and hours of use.

Lamp lifespan projections were based on the findings of a Stewardship Ontario working group on fluorescent lamps to determine lifespan projections, see Appendix B.⁶

Using the sales data from Table 4.1 and the lifespan estimates from Table B-1, the number of lamps available for collection in British Columbia has been calculated and is presented in Table 4.2. After the program begins, improved sales data will be available, and further research will be undertaken to improve the method of estimating the amounts available for collection.

⁵ Data provided by EEMAC. BC data estimated as 70% of EEMAC member Western Canada sales assuming residential sales to be 100% of CFL with ballasts and 50% of fluorescent tube consumer channel sales and 5% of the fluorescent tube commercial channel sales. Sales data for non-EEMAC producers is not known. Actual program member sales will be reported to the program after the program begins.

⁶ Stewardship Ontario (2009). *Draft Consolidated Preliminary Municipal Hazardous and Special Waste Program Plan Volumes I & II*. Accessed at <http://www.stewardshipontario.ca/mhsw/index.html>

Table 4.2 Fluorescent Lamps Available for Collection From Residential Sources

Year	Residential	
	CFLs (units)	Fluorescent Tubes (units)
2010*	637,300	585,250
2011	483,000	373,500
2012	487,800	364,200
2013	632,950	308,800
2014	477,500	305,400
2015 *	643,300	420,600
Total	3,254,000	2,357,750

*Note: the program plan only covers 6 months in 2010 and 2015, but full year data is shown for ease of comparison

4.3 Collection

Program Products are currently collected from consumers by some retailers and local government depots without charge. Certain recycling businesses will also accept Program Products for a fee.

Retailers

Many British Columbia retailers, including:

- Home Depot (29 locations),
- IKEA (2 locations),
- RONA (corporate stores) and
- London Drugs (45 locations)

have voluntarily set up in-store take back programs within BC, enabling consumers to drop off used CFLs.

In addition, BC Hydro has partnered with selected retailers (generally hardware stores participating in the Power Smart events) who accept CFLs from their customers.

Local Government

Used lamps are accepted from residents without charge at four municipally sponsored depot locations⁷:

- Abbotsford Community Services,
- District of Mission,
- Mission Recycling Depot,
- Nanaimo Recycling Exchange

and three regional districts:

- Cowichan Valley Regional District –three sites
- Capital Regional District –one site

⁷ (Information obtained from Recycling Council of BC Recyclepedia available at <http://www.rcbc.bc.ca/recyclepedia>)

- North Okanagan Regional District –six sites

Recycling businesses

Several recycling businesses (Edmonds Recycling, Ellice Recycle, Happy Stan's Recycling Services, Newalta Corporation, Nu-Life Industries, Steel Pacific Recycling and The Battery Doctors) accept fluorescent lamps (usually for a fee).⁸

4.4 Processing

Currently, there are four primary processors in BC and five others across the country. The method of processing employed is usually that of breaking the lamps under negative air pressure, then the glass, phosphor-mercury powder and other components are separated, cleaned and forwarded to downstream recycling outlets.

4.5 Public Awareness

Retailers that offer take back programs have been advertising this service. Two of British Columbia's electrical utilities, BC Hydro and Fortis Energy encourage the recycling of CFLs and include information on local recycling options in their communications (website, pamphlets, public events). There has been significant media coverage of the trend towards the use of CFLs in the home, sometimes including information about the importance of proper disposal of mercury-containing lamps. The Recycling Council of BC also informs consumers where to dispose of items through its hotline and website.

5. Planned Program Operations

5.1 Collection and Transportation

Collection Locations

The Program will establish a system of permanent year-round collection locations in British Columbia for the collection of used intact lamps from consumers. There will be no charge to drop off program products. The Program will not directly own or manage collection depots, but intends to contract with interested organizations. Collection sites may be located at facilities such as retailers, recycling organizations (both non-profit and for profit), local government recycling centres or transfer stations or at other associations or businesses. Collection sites will accept all program products regardless of brand but there will be guidelines to ensure acceptance of only program material.

Actual depot locations will be determined through the implementation process based on facilities available, ability to meet standards including environmental and safety ones, proximity to population, ease of access and cost effectiveness, with the intent

⁸ Ibid.

of establishing a province-wide network of sites that provides reasonable access to consumers. Where necessary, the Program will supplement the depot collection system with a number of one-day events in areas where there are no collection sites, possibly in partnership with a retailer, or municipality or regional district.

Collection Containers and Transportation

It is the intention of the program to contract out for the services of transportation from collection sites to processors (possibly employing consolidation points). Program products will be collected and transported using collection containers that are suitable for collection sites, and fulfil environmental, safety and transportation requirements.

Collection and Transportation Standards

Standards for collection sites and transportation services will be developed (see Appendix D for details) and adherence to the standards will be required of all collection sites which will be verified through audits. The specific applicable requirements of the BC Hazardous Waste Regulation relating to the collection and transportation of Program Products will be included in the Standards.

5.2 Processing and Tracking

The Program intends to negotiate contracts for the processing of used lamps and will consider available service providers based on a number of factors including location, capacity, processing methods, downstream markets and conformity with processor standards (see Appendix D for details). A tracking system will be developed to track the used lamps from the point of collection to final disposition. Audits will be performed to ensure compliance by processors with processor standards. Information on the final disposition will be provided in the annual reports.

5.3 Product Life Cycle and the Pollution Prevention Hierarchy

Reduce

Fluorescent lamps are recognized as an energy efficient lighting technology, and significant advances have been made in increasing product lifespans. This has reduced the environmental impact of the lamps, as fewer are required to provide the same service.

Most CFLs sold in 2003 lasted an average of 3 years but Energy Star™ rated lamps now can last up to 12 years.⁹ Fluorescent tubes are now available in a longer life version that provides 30,000 hours of light compared to the 24,000 hours of other lamps. In addition, fluorescent tubes are now available that are smaller in diameter (T8 or T5), providing the same or more light with about 50% less material resources by weight.¹⁰

⁹ Stewardship Ontario (2009). *Draft Consolidated Preliminary Municipal Hazardous and Special Waste Program Plan Volumes I & II*. Accessed at <http://www.stewardshipontario.ca/mhsw/index.html>

¹⁰ European Lamp Companies Federation. *Climate, environment & health*. Accessed at http://www.elcfed.org/2_health_environment.html-materials.

The main environmental concern with fluorescent lamps is the mercury content. Mercury is a necessary part of fluorescent lamp technology, but manufacturers have been able to reduce the amount of mercury in the lamps. The average Canadian compact fluorescent lamp contains 3.7 mg of mercury (roughly the size of the ball in the tip of a ball point pen).¹¹

The Canadian Council of Ministers of the Environment (CCME) set Canada-wide standards for the amount of mercury in lamps with targets of a 70% reduction by 2005 and an 80% reduction by 2010 against the 1990 baseline of an average of 43 mg. By 2006, members of Electro-Federation Canada had exceeded the target with an 81.6% reduction in mercury content for an average of 7.9 mg per lamp (includes all fluorescent and HID lamps sold in Canada by Electro-Federation members).¹²

Manufacturers continue to research ways to improve lighting performance and reduce environmental impacts. Advances are expected in other lighting technologies such as LEDs (light emitting diodes).

Redesign/Eliminate

Presently, close to 100% of the materials in fluorescent tubes can be recycled so redesign for this reason is not warranted.¹³ The process for CFL recycling is similar to that of the tubes however the additional component of a plastic or ceramic base is more difficult to recycle.

Reuse

The program is designed for fluorescent lamps that no longer work and cannot be reused. Options for managing unused lamps include the BCIMEX or the Reuses networks run by the Recycling Council of British Columbia.

Recycle/Recover

Processed lamps will be broken down into their component parts. The resulting glass, mercury and other components will be recovered and put back into the market. Almost 100% of the materials can be recycled in this system for fluorescent tubes. Plastic bases of the CFLs would be consumed in the thermal metal recovery process where they would contribute to the energy used to heat the system whereas ceramic bases may be used as aggregate or may be waste. Table 5.3 shows the possible final disposition of the materials and table 5.4 shows the relative amounts of the

¹¹ Ibid.

¹² Personal communication with Wayne Edwards, EEMAC

¹³ Kelleher, M. (2007). *Fluorescent Lighting in Ontario –Lifespan Model and Research Report to Waste Diversion Ontario*. Accessed at <http://www.wdo.ca/files/domain4116/Final%20Review%20of%20Fluorescent%20Capacity%20Report%20Sept%2025%2007.pdf>

materials. The program will strive to reach the target of recycling 100% of the material recovered.

Table 5.3 Components of Lamps and Potential End Use

Material	Possible Final Disposition
Glass	Fibreglass, reflective paint
Aluminum	Smelter and resale
Mercury	Retorted and resold
Phosphor powder	Separated from mercury and remains as phosphor powder, may be waste
Other metals	Smelter and resale
Plastic	Incinerated in resmelt process
Ceramics Waste	

Table 5.4 Compositions of Compact Fluorescent Lamps and Fluorescent Tubes¹⁴

Material	Composition of a CFL	Composition of Fluorescent Tube
Glass 75-9	0%	75-95%
Mercury <0.015%		<0.01-<0.05%
Lead Oxide	0.2-2%	0.2-2%
Aluminum Oxide	0-2%	0-2%
Phosphor Powder	0.5-3%	0.5-3%
Miscellaneous Compounds (fluoride, manganese dust, tin dust etc.)	0-0.1%	0-0.1% per compound
Plastic/Ceramic base	Data not available	Not applicable

5.4 Consumer Awareness

The Regulation requires that the plan makes adequate provision for informing consumers of the product stewardship program, the location of collection facilities, how to manage products in a safe manner as well as the environmental and economic benefits of participating in the program. The Program will develop a communication strategy to educate consumers about the program.

Communication Methods

The Program will use a number of methods of creating consumer awareness of the program including the location of the collection sites, and information regarding safe product handling. Methods used will be selected based on feedback from market

¹⁴ Kelleher, M. (2007). *Fluorescent Lighting in Ontario –Lifespan Model and Research Report to Waste Diversion Ontario*. Accessed at <http://www.wdo.ca/files/domain4116/Final%20Review%20of%20Fluorescent%20Capacity%20Report%20Sept%2025%2007.pdf>

research, focus groups and surveys. The environmental impact of the methods will also be considered. Communication methods will include:

- **Website** – The Program website will include information on what items can be returned and where, using a map based depot finder. Product information on how to best use fluorescent lamps and what to do if one should break will be posted. Links to other organizations such as utilities and recycling organizations will be provided for users looking for energy efficiency or recycling information. Brand owners and other agencies with an interest in recycling may wish to link to the Program website. The program will also investigate opportunities to promote the program on the lamprecycle.org website, which is printed by some manufacturers on the Program products.
- **Recycling hotline** 1 800 667 4321 or 604 RECYCLE– the Program intends to participate in the RCBC recycling hotline service by which consumers can contact RCBC operators during business hours and obtain information about disposing of the proposed stewardship agency program products as well as any other products.
- **RCBC Recyclepedia** – the program will provide RCBC with updated lists of collection sites for inclusion in their online search system providing consumers with information on where to take back different products.
- **Point of return** – all participating collection depots will be provided with program signage to display and counter cards to distribute to consumers.
- **Local government** – An information package will be sent to local governments to inform them of the new program, including a press release, web link, appropriate media and contact information.
- **Annual report** – the reports will be posted on the website. The reports will include details for consumers on the environmental and economic benefits from returning the lamps.
- **Earned media and advertising** – the Program will also consider the use of earned media (press releases etc) and paid advertising.
- **Other** – other methods of communications may be identified through the market research study, focus groups and communication plan development

Partnerships

The proposed stewardship agency would also like to partner with organizations that already communicate with consumers about product return or fluorescent lamps. The

communications generated through these collaborations will be determined through discussions with potential partners. Some possible avenues are:

- **Point of sale** –these could include shelf talkers, counter cards, consumer brochures or program posters. These will be revised from time to time and offered routinely to retailers who will have the option of displaying and distributing them.
- **Local government partnerships** – the Program will seek partnership opportunities with local governments to inform householders of the availability of the program which may include:
 - advertising in municipal calendars
 - participation in community recycling events and promotions
 - links from local government websites to Program website and inclusion of program information in recycling specific web pages.
 - inclusion of program information with local government householder communications.
- **Utilities** – BC Hydro and Fortis Energy have extensively promoted to their residential customers the energy efficiency use of fluorescent lamps. The Program will investigate opportunities to work with the utilities to reach target consumers and to ensure consistent messaging.
- **Others** –Brand owners and other agencies with an interest in recycling may wish to have links to the proposed stewardship agency website.

The communication strategy will be modified over time based on the results of the methods employed and ongoing studies.

5.5 Administration

Fees and Budgeting

The program will be managed and funded by members. The members will pay fees to the Program based on the number of units of Program Products sold in British Columbia after July 1, 2010. Quantities sold will be reported each reporting period (see Appendix C for sample form). The fees will be set through the Program budgeting process as program revenue and cost estimates are developed and will be posted on the program website once set. Fees may be adjusted in the future to address surpluses or deficits but all fees are used for program purposes. Producers, and then their distributors and retailers may or may not choose to recover the fees as a separate invoice item or charge (i.e. visible fees). The program will develop recommended language for producers to use should they choose to show a visible fee. A financial audit of the program is required should visible fees be charged. It is assumed that program fees will be subject to Harmonized Sales Tax (HST) which is being introduced to British Columbia on July 1, 2010. Cash flow advances and pre-

program expenses relating to plan development and implementation will be reimbursed from program revenues at a reasonable rate of interest.

Risk Management and Reserve Fund

As part of its risk management system, the Program intends to obtain environmental insurance and to build and maintain a reserve fund. The reserve fund will serve a number of purposes including the funding of any uninsured environmental claims (including deductibles) and to allow for stability of program funding in case of unexpected collection volume increases, fluctuations in operating costs or reduced revenue due to economic or other factors. The reserve fund will be limited to an amount determined by the Board of Directors.

Producer Compliance

In order to maintain a 'level playing field' for the program members and to ensure compliance with the Regulation, The proposed stewardship agency will actively search for, identify and recruit producers of program products. The list of Program members and brand names will be available on the website.

Techniques to identify potential producers will include internet searches, store visits, information obtained through producer compliance reviews conducted by the program, through audits of collected materials and by information received from existing members. Once a potential producer is identified, the following is the compliance process protocol to be followed by the stewardship agency in recruiting producers of such products:

1. Notification by telephone and/or email advising of the regulatory obligation and inviting the brand owner to join the Program within a 30 day period.
2. Two formal letters to the brand owner noting the prior contact, referring to the regulatory obligation and advising the brand owner of the Program's intention to notify the ministry for enforcement purposes if compliance is not demonstrated within a second 30 day period (which may be accomplished by joining the stewardship agency or by participating as a steward regulated under Part 3 of the regulation).
3. The proposed stewardship agency will issue a letter to the Ministry of Environment advising of the circumstances including the name of the brand owner, the product and location of place of sale, with the request to the Ministry of Environment to investigate and if appropriate conduct enforcement proceedings.

Dispute Resolution Procedure

The proposed stewardship agency will contract with all suppliers and service providers to the program by the use of commercial agreements. Any disputes arising from collection or processing contracts would be resolved using normal commercial legal procedures.

6. Strategies and Actions

In this section the strategies and actions for implementing the program and improving program performance are set out. As this is a new program with few precedents, strategies and actions have been listed for the first two years with the expectation that future actions will be determined by the experience and needs identified during the actual operation of the program. The potential strategies and actions for later years are listed for information purposes only. An action plan for actions in years 3-5 will be developed at the end of year 2 based on the program experience and results to that date.

6.1 Collection

Vision	To continually increase collection of available products through a network of accessible, well-run collection sites
Actions	_____
year 1	<ul style="list-style-type: none"> Establish collection network, analyse coverage, determine need for collection events
year 2	<ul style="list-style-type: none"> Expand the number of permanent collection sites, conduct events as needed
Possible actions for later years	<ul style="list-style-type: none"> Continue to improve collection system coverage and accessibility Obtain feedback from local government and address issues Support the imposition of landfill bans where adequate collection facilities exist Analyse barriers and develop strategies to improve capture rate Participate in municipal waste audits to determine leakage from program

6.2 Awareness

Vision	To have all consumers of the products aware of the program, where to find depot location information and how to safely handle the product
Actions	_____
year 1	<ul style="list-style-type: none"> Develop a communication strategy based on market research and focus groups Design the communications elements Establish the program with launch-specific communication Implement the communications strategy (which at a minimum would include a website, RCBC hotline and Recyclepedia, initial launch media for point of return, initial launch media available for point of sale and advertising for launch)
Year 2	<ul style="list-style-type: none"> Conduct consumer awareness survey Modify communication strategy to address deficiencies found in awareness survey

	<ul style="list-style-type: none"> • Work with potential partners*
Possible actions for later years	<ul style="list-style-type: none"> • Conduct community based social marketing pilot projects • Conduct consumer awareness studies and focus groups • Use results to modify communication strategy • Roll out successful pilot programs to the broader community and continue testing new ones

* Actions that involve working with partner organizations are dependent on the willingness of the partners to be involved.

6.3 Environmental Aspects

Vision	To decrease the environmental impact of the products through product design, collection and recycling of the product, and program efficiency
Actions	_____
year 1	<ul style="list-style-type: none"> • Develop metrics and baseline data for impacts of program
year 2	<ul style="list-style-type: none"> • Analyse end markets of materials and look for options to close the loop on them or move them higher in environmental efficiency (ex. closer markets, upcycling)
Possible actions for later years	<ul style="list-style-type: none"> • Look for more efficiencies in the collection, transport and processing operations • Implement an environmental management system • Audit collectors, transporters and processors to ensure standards are being met • Conduct Life Cycle Analysis of the program and identify areas to improve

6.4 Research & Development

Vision	To continually improve the program and conduct research and development to achieve this
Actions	_____
year 1	<ul style="list-style-type: none"> • Collection container audits to determine composition by product type and brand owner • Research and evaluate best practices for determining and measuring units available for collection and other methods to determine collection rate (such as surveys, waste audits, etc)
year 2	<ul style="list-style-type: none"> • Conduct research and demonstration projects for new or improved technologies and reusable transportation container systems
Possible actions for	<ul style="list-style-type: none"> • Research to identify program areas that need improvement and identify actions to address them

later years	<ul style="list-style-type: none"> Identify and strengthen existing markets and develop new markets for recycled materials
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7. Program Performance & Targets

The proposed stewardship agency will assess the performance of the program with the quantitative measures noted below, which will be presented in the program annual reports (Appendix E)¹⁵ and available to the public on the Program website.

7.1 Capture Rate

Setting meaningful collection targets is a challenge for fluorescent lamps. This will be one of the first fluorescent lamp collection programs in Canada so there is no meaningful historical data on which to base targets. Targets will be updated based on actual data and experience gained in the first years of program operations. (For background information, in another jurisdiction intending to have a stewardship program, the current collection rate is 6%.¹⁶)

Because of the durable nature of the Program products, each product unit sold should eventually be available for collection. The determination of the number of units available for collection in a given year is subject to the availability of historic sales data, consumer use patterns and generally increasing product longevity, as discussed in section 4.2. Therefore the quantity of Program products available for collection will vary from year to year until the market and lifespans stabilize.

Due to the long lifespan of the products, the *capture rate* (quantity collected compared to quantity believed to be available for collection in that year) will be measured as opposed to the *recovery rate* (quantity collected compared to quantity sold in a given year).

The data in Table 4.2 will be used initially in determining the amount available for collection, subject to refinement after the Program begins. Annual sales quantities will continue to be recorded and that data will be used to calculate the future capture rates.

Performance Measures

- Capture rate (% based on amount of product collected over amount available for collection in that year per Table 4.2)

¹⁵ Kelleher, M. (2008). *Extended Producer Responsibility (EPR) Program Measurement and Tracking*. Prepared for Canadian Council of Ministers of the Environment.

¹⁶ Stewardship Ontario (2009). *Draft Consolidated Preliminary Municipal Hazardous and Special Waste Program Plan Volumes I & II*. Accessed at <http://www.stewardshipontario.ca/mhsw/index.html>

Capture Rate Targets

Table 7.1 Capture Rate Targets

Year	2010* (6 months)	2011	2012	2013	2014	2015* (6 months)
Capture Rate Target	10 - 12%	16 - 25%	22 - 37%	28 - 50%	34 - 62%	40 - 75%
CFL Units	31,865	77,280	107,316	177,226	162,350	128,660
CFL Weights (kg)	3,182	7,721	10,724	17,707	16,219	12,856
Fluorescent Tubes Units	29,263	59,760	80,124	86,464		103,836
Fluorescent Tubes Weight (kg)	7,688	15,642	20,722	22,489	27,057	21,719

* percents are annual, but units and weights have been calculated for 6 months.
 All numbers in the chart are given as example based on the minimum target rate.

This table also shows the number of units and weights for the minimum targets set out in the capture rate target line. These numbers represent an estimate of achievable capture rates, noting the lack of comparable programs on which to base these numbers. The program plans to collect BC specific data from producers and determine if the model upon which these rates are based is accurate. The experience and data gained during the first two years of the program will allow for more meaningful measures of performance to be determined.

The program has set a range for the capture rate targets. Given the lack of data available, it is difficult to set capture rates that are both ambitious and reasonable. The program believes that the minimum rates provided in the chart are achievable within the first 5 years of program operation. However, working towards continuous improvement and aiming to be one of the best collection programs for mercury lamps in the world, the program will strive for a capture rate of 75%, as suggested by the Recycling Regulation.

If the program has not met the 37% capture rate target at the end of 2012, it will undertake research to determine the barriers to higher capture rates. This research will start with focus groups and may also include surveys. Once the barriers are identified, the program will create an action plan to address them. The actions, timelines and results will be included in the future annual reports.

7.2 Consumer Awareness

The plan for creating consumer awareness is discussed in section 5.4. The Program will conduct the market research study that, among other things, will establish a baseline of awareness among consumers before the program launch. To measure the performance of the communication strategy the Program proposes to conduct a consumer awareness survey every two years to track consumer awareness of the program and product handling.

Performance Measures

- Percentage of population aware of the program

Targets

The Program will establish consumer awareness targets after baseline data is available in year 1. Targets for the increase in awareness can be set and then revised as further surveys are completed.

7.3 Accessibility

Performance Measures

- Number of collection sites and collection events
- Population within a certain proximity of the drop-off depot
- Average travel distance to drop-off depot

Targets

Once the initial collection site network is established at the program launch, the accessibility of collection sites for the BC population will be assessed. Targets will be set at the end of year 1.

7.4 Other Performance Measures

Pollution Prevention Hierarchy –materials will be tracked and their final disposition reported annually. In year 2, targets will be set for percentage of materials recycled.

Other performance measures will be tracked (though they may not be suitable for targets) and new performance measures may be developed as the Program progresses. They will be included in the annual reports (Appendix E).

8. Stakeholder Consultation

Stakeholder consultations were conducted in September 2009 as a prerequisite to the finalization and filing of this plan with the BC Ministry of the Environment.

The consultations included:

- Email communication to stakeholders (who were requested to forward it to their members where appropriate)

- Regional consultation meetings were held in Richmond (Sept 14), Nanaimo (Sept 15), Kelowna (Sept 16) and by conference call for Prince George participants (Sept 24)
- A web-based conference call (Sept 18)
- Written submissions provided by stakeholders

Eighty-three people participated, representing organizations from provincial and local governments, the lamp and energy industry, recycling organizations, retailers, processors, transporters, environmental groups and other BC stewardship programs.

See Appendix F for the consultation plan and feedback received and responses.

Program plan language has been clarified and corrected in response to comments received in the consultation process. Some comments related to areas that are more operational in nature and do not require changes to the plan. Those comments will be taken into consideration in the implementation phase.

Appendix A. The Proposed Stewardship Agency Member List

This is a list of the founding members. Program membership will be open to all obligated Producers.

EiKO Canada Ltd.
GE Consumer & Industrial
Liteline Corporation
OSRAM SYLVANIA LTD.
Panasonic Lighting
Philips Lighting
Standard Products
Venture Lighting
USHIO America, Inc.

Appendix B. Details on Lifespans & Collections

Information in italics is the Stewardship Ontario discussion of the product lifespan: *Lifespans of CFLs have been increasing over time as the design has improved and more have become Energy Star compliant. For this reason, a slowly increasing lifespan has been assumed, as shown in the table below.*

Table B-1 Assumptions on Fluorescent Lamp Lifespan Distribution

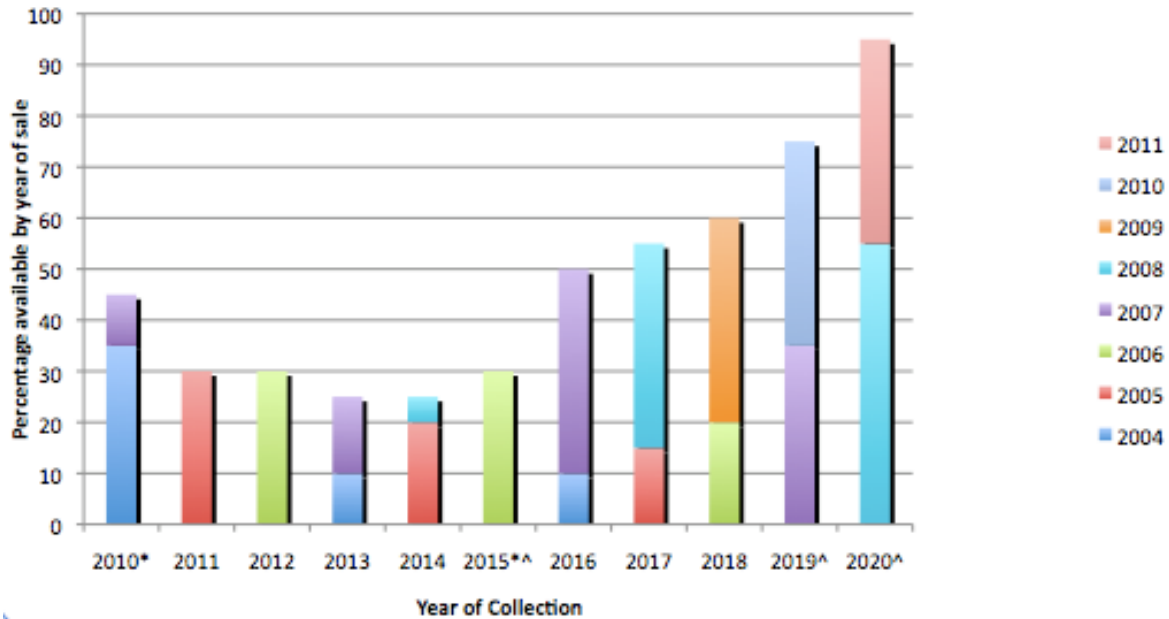
By Year of Product Sale Year Sold	Percentage Lasting 12 years	Percentage Lasting 9 years	Percentage Lasting 6 years	Percentage Lasting 3 years	Average Lifespan (years)
2002	0%	0%	43%	57%	4.3
2003	0%	0%	43%	57%	4.3
2004	10%	10%	35%	45%	5.6
2005	15%	20%	30%	35%	6.5
2006	20%	30%	30%	20%	7.5
2007	35%	40%	15%	10%	9.0
2008	55%	40%	5%	0%	10.5

*The Working Group believes that virtually all CFLs now meet Energy Star requirements. While the average lifespan is assumed to be 4.3 years for a product sold in 2003, based on Ontario Energy Board figures, it has been assumed that by 2006 the great majority of the market met Energy Star standards. The following data was provided by the Stewardship Ontario Working Group on current CFL lifespan: 44% of CFLs last 10,000 hours
30% of CFLs last 8,000 hours
20% last 6,000 hours
It was assumed the final 6% last 4,000 hours.*

Assuming that CFLs are turned on an average of 3 hours per day, the weighted average of the lifespan data outlined above is 7.5 years. Energy Star ratings above refer to the point at which 50% of the CFLs burn out, therefore we increased from a lifespan of 4.3 years for products sold in 2003 to 7.5 years by 2006, when most of the market was reportedly transformed to Energy Star CFLs and increasing to a lifespan of 10.5 years after that point. The distribution of lifespans required to meet the average is presented in Table B-1. The Fluorescent Product Flow Model distributes the lifespans among products sold in a given year by assuming some last longer and some last a shorter length than the average lifespan as shown Table B-1.

While the Fluorescent Working Group felt that the lifespan of fluorescent tubes is an order of magnitude longer than that of CFLs, probably more like 20,000 hours per unit, the same lifespan was used as the tubes were considered to be in a residential-like setting.

Percentages Available for Collection by Year of Sale and Lifespan



The chart above shows the percentage of each year's sales available for collection in each year using the Stewardship Ontario model. Columns marked with an ^ show where the market percentage for some lifespans of lamps has been estimated (holding steady at a 40% 9 year lifespan and a 60% 12 year lifespan split). * indicates that the program plan only covers 6 months in these years so the amounts would be halved.

Appendix C. Producer Reporting Form

This a representation of information a Program member will periodically report to the Program. The quantities sold data will be applied to the fee rates established by the program to calculate the fees payable by the Producer to the Program. An on-line reporting system will be used.

Producer Name	
Reporting Period	
Number of CFLs –with ballast	
Number of Fluorescent tubes (4 ft) -T8	
-T12	
-T5	
Other	
Percentage of lamps meeting Energy Star standards	
Description of methodology and data used to prepare the report	
List of brands or trademarks covered	
List of affiliates and /or franchisees covered	

Appendix D. Service Provider Standards

The BC Fluorescent Lamps Stewardship Program will include standards to ensure that program materials are collected, stored, transported and processed in a safe and environmentally sound manner in accordance with local, provincial and national regulations and international standards, as they may apply. Guidelines or manuals will be developed for service providers based on these standards.

Service Provider Standards – General

The following elements may be included in the service provider standards:

1. Collection, transportation and processing services will only be provided by selected service providers in good standing.
2. All service providers will be subject to audit at the discretion of the program.
3. Service providers will be required to have a satisfactory tracking and reporting system.
4. Service providers will need to demonstrate and verify organizational compliance with, but not limited to, the following:
 - BC Environmental Management Act (as applicable)
 - BC Hazardous Waste Regulation (as applicable)
 - BC Employment Standards Act
 - BC Occupational Health and Safety Regulation
 - Transportation of Dangerous Goods Act (as applicable)
 - Canadian Environmental Protection Act
 - Canadian Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (under which Canada's Basel Convention obligations fall)
 - Labour Code of Canada
 - Municipal zoning by-laws or other by-laws such as fire codes, parking and hours of operation
 - Regulations of other jurisdictions (as applicable)
5. Service providers will be required to provide a statement of compliance as well as provide notification of any non-compliance.

Collection Standard

Collection Sites will have standards for matters such as:

- setting up the site,
- acceptable/not acceptable program products,
- staff training,
- records collection and retention,
- provision of program information for consumers,
- emergency reporting,
- management procedures for handling lamps that are accidentally broken,
- planning and
- health and safety.

Transportation Standard

Transporters will be assessed for:

- conformity to applicable legislation and regulations,
- record keeping system,
- insurance coverage,
- licensing,
- emergency response plan,
- management procedures for handling lamps that are accidentally broken and
- staff training.

Processing Standard

A processing standard will be developed to cover the following elements:

- Insurance requirements based on processing activity
- Workers' compensation coverage
- Processing in accordance with approved operating procedures
- Security of facilities
- Processing time specifications to prevent stockpiling
- Evidence of an Environment, Health and Safety management system
- Mapping of materials flow to downstream markets and processors which in turn must be subject to audit and meet all program standards which may include product management restrictions
- Residual and product management method declarations as requested e.g. certificate of recycling, landfill or destruction
- Reporting of processing activities including amount and type of material, quantities of processed material sent for further processing or to downstream end-markets, corresponding final disposition by material and product, and the recycling and disposal rates of products and material
- Processing of waste must be done in an economic and environmentally acceptable manner
- Emergency response plans and a contingency plan
- Maintain emissions controls (if applicable)
- Notify Program manager of any non-compliance events, fines, regulatory orders, or environmental incidents
- Maintain a closure plan

Appendix E. Annual Report Data

The program intends to include the following information in annual reports.

Collection

- Absolute collection (units and weight of product collected)
- Capture rate (% based on amount of product collected over amount available for collection in that year per Table 4.2)
- Absolute collection per capita (could be units and by weight)
- Absolute collection by Regional District

Awareness

- Percentage of population aware of the program
- Participation rate (number of visitors returning program products)
- Website visits
- RCBC Recyclepedia website hits for program specific data
- RCBC Hotline calls about program

Accessibility

- Number of collection sites and collection events
- Population within a certain proximity of the drop-off depot
- Average travel distance to drop-off depot

Other

- Progress against stewardship plan targets and strategies
- Amount of each type of material collected (mercury, glass, aluminum, etc) - weights
- Post-collection disposition of material
- Expenses (program specific)
- Cost per unit of collected material
- Total cost per kg diverted
- Financial audit report (if visible fees charged)

The above measures will be shown with previous years data (where applicable) to show the historical context and demonstrate any trends.

Appendix F. Consultation Plan and Report

Consultation meetings were scheduled for the week of Sept 14, 2009. The following is the invitation letter which was been issued.

Save the date!

Notice of Public Consultation for BC Fluorescent Lamps Stewardship Plan

Dear Sir or Madam,

You are invited to attend consultation meetings scheduled for the review of the draft BC Fluorescent Lamps Stewardship program plan at the following locations and dates:

1:30 pm-3:30 pm, Monday, September 14th, 2009
Travel Lodge Hotel Richmond
3071 St. Edwards Dr, Richmond, BC

1 pm-3 pm, Tuesday, September 15th, 2009
The Coast Bastion Inn
11 Bastion St., Nanaimo, BC

10 am-12 pm, Wednesday, September 16th, 2009
Days Inn Kelowna
2649 Hwy 97 North, Kelowna, BC

1 pm- 3 pm, Thursday, September 17th, 2009
Ramada Hotel Downtown Prince George
444 George St., Prince George, BC

(Note: while advertised, due to low registration, a conference call was held instead on September 24)

9 am- 11 am Friday, September 18th, 2009
A **conference call** meeting. Call-in details will be sent to those who RSVP for this date.

Please RSVP by August 31st to let us know which meeting you plan to attend. Please note that if it appears that there is insufficient attendance for any of the meetings, participants will be contacted to make alternative arrangements.

The draft program plan will be available prior to the meetings and will be posted on the www.electrofed.com and www.productcare.org websites.

Notification of posting will be emailed to invitees and to those who RSVP.

You are also invited to submit written comments to the program plan on or before September 30, 2009. Please send comments:

by email to: erin@productcare.org

or by mail to:

Fluorescent Lamp Stewardship
c/o Product Care Association
12337 82A Ave., Surrey, BC V3W 0L5

or by fax to 604 592 2982

For further information and to RSVP, please contact Erin Webster at erin@productcare.org
Telephone: 604 592 2972 x 208
Toll free: 1 888 772 9772 x 208
Fax: 604 592 2982

We look forward to meeting with you to discuss the BC Fluorescent Lamps Stewardship program plan.

Wayne J. Edwards
Vice President, EEMAC
Electro-Federation Canada

Communications about the consultation on this draft plan were sent out to reach stakeholders who may be interested in fluorescent lamp stewardship in BC.

Key groups that had been notified include:

- Local Government including BC Product Stewardship Council and the Union of BC Municipalities
- Senior Governments including BC Ministry of Environment
- Lamp & Energy Industry including EEMAC members and utilities
- Recycling organizations including RCBC, Solid Waste Association of North America and Coast Waste Management Association
- Retailers including the Retail Council of Canada
- Processors & Transporters
- Environmental and public interest groups
- Other stewardship programs in BC (new and developing)

Feedback received from stakeholders was recorded and is noted below by section (questions on similar themes have been grouped together).

Concern (numbers in brackets reflect the number of times mentioned if more than once)	Response (numbers in brackets refer to sections of the plan)
Products	
A program for fluorescent lamps sold to the industrial, commercial and institutional sector is needed. This will make the plan meet the regulation, be more economical and avoid confusion and dumping on non-program product at collection sites (27)	A plan for these materials will be submitted by December 31, 2011 In the interim, there will be a quantity threshold for the number of lamps delivered by a single customer.
What about other products covered by the	This program covers only residential

legislation: ballasts, fixtures and other lamp types? (6)	fluorescent lamps and is not involved with any plans being developed for these other items.
Are there other plans for the same products?	None have been identified so far but the regulation allows for multiple plans.
Collections	
The need to provide consumers with convenient options to return used lamps (resource recovery parks, retailers, existing sites). (7) Special attention is needed for rural areas. Approves that the plan states all service providers will be contracted and need to meet standards. Clarified that participation by service providers is voluntary.	This is a key focus of the plan. (See sections 5.1, 6.1, 7.3)
Will there be community discussions as to where the collection facilities will be located?	As collection sites choose to participate voluntarily as a business decision, no discussions will be held with the broader community. All collection sites will need to abide by local zoning bylaws.
The need for incentives for collection sites to participate. (7)?	The program intends to have a province-wide network of collection facilities and will need to make business arrangements with various service providers to achieve that. Each service provider will sign a contract to provide the services as a willing partner
Will there be incentives for consumers to participate? (2)	No specific consumer incentives are planned at this time.
The process for retailers or “collectors” must be simple. It is a major deterrent for these individuals if the logistics and paperwork are prohibitive. With regards to collection & storage, what do you expect will be the amount and how fast do you intend to transport it? Will collection sites be limited to the amount of lamps that can be on their premises (due to the mercury content within the lamps)? Will mercury-related insurance be required for collectors? (5)	These specifics will be developed in the implementation phase. Consideration will be given to the safety of collection and processor personnel and the needs of collection sites, transporters and processors while ensuring standards are met (including the BC Hazardous Waste Regulation), materials are tracked and progress is made towards the visions of the program.

<p>The need for clear procedures for handling broken lamps, ways for residents to dispose of their broken lamps and procedures to avoid breakage. (3)</p>	<p>The plan notes that safe handling of products will be part of the message communicated to consumers. Disposal of broken lamps is not addressed in the plan as it may impact the requirements for collection sites under the BC Hazardous Waste Regulation and thus the program's ability to set up an adequate collection network. This will be examined.</p>
<p>Will individual collectors need to sort or analyze brands (2)?</p>	<p>Confirmed that individual collectors do not need to sort or analyze brands (5.1).</p>
<p>Suggestions for standards for collection: should preclude possibility of single stream curbside collection and collection sites must have trained staff (2).</p>	<p>These suggestions will be factored into the standard development.</p>
<p>The collection sites that already are collecting lamps and have infrastructure in place may be adversely affected. What, if any, would be the policy about reimbursing those depots for their infrastructure? Will there be reimbursement for groups that have already collected bulbs? (2)</p>	<p>The program is not responsible for decisions made by other parties prior to the commencement of the program.</p>
<p>What impact will this program have on existing collection programs and their costs?</p>	<p>The program is not responsible for decisions made by other parties prior to the commencement of the program. Costs for handling program products delivered to approved collection sites will be the responsibility of the program.</p>
<p>Consider assisting collection sites with infrastructure in some communities.</p>	<p>The first priority will be contracting with service providers that can meet the standards. Future analysis of the collection network will identify gaps and potential solutions to those gaps will be examined at that time.</p>
<p>What will community events look like?</p>	<p>Specifics will be developed in the implementation phase. It is likely that these events will partner with other similar events to achieve maximum collection.</p>
<p>Transportation</p>	
<p>What is the policy on transport of broken lamps?</p>	<p>The transportation standard will follow all applicable regulations. (Appendix</p>

	D)
Processing	
Is there adequate processing capacity in BC? (2)	Preliminary investigations show that there is processing capacity within BC. Selecting processors will be part of the implementation phase once the processor standards are finalized. (4.4)
Will the program accept crushed lamps? Will drum top crushers be allowed under the standards? (8)	Since this program is just for residential lamps, the program at collection does not accept crushed lamps. The use of drum top crushers at collection, consolidation or processing sites will be covered in the applicable standard.
The need for transparency of final disposition of materials and to move materials up the pollution prevention hierarchy. (Ceramics, ballasts, phosphor powder, mercury and fire retardants in plastic mentioned specifically.) (6)	Processing standards will be developed in the implementation phase and then processor options considered. The final disposition of materials will be evaluated against the pollution prevention hierarchy though it may depend on the contracts secured by the initial processors. Distance to transport will also be considered. The plan addresses this issue in sections 5.1, 5.2, 6.3 & 6.4 as well as Appendix E (Annual Report) through tracking, auditing and reporting with a goal to move materials higher up the hierarchy where feasible.
Communications	
How will consumers know how to dispose of the lamps?	There will be a communications strategy developed to inform consumers. (5.4, 6.2, 7.2)
The communication strategy should include non-retail-based methods as well. Consider using the Metro Vancouver recycles.org database as another way of communicating to the public. Suggestion to have an information kit to go out to municipalities (local governments) that includes a letter with stewardship agency website, a PR ready blurb about the program, list of contacts, list of opportunities for municipalities (i.e.	These suggestions will be considered in the development of the communications strategy.

<p>calendar), posters and brochures. Also suggested a media release through local newspapers in the summer (when they are looking for more news). One idea for marketing is to have projection of program info on store floors where lamps are sold. (4)</p>	
<p>Administration</p>	
<p>Who may be the producer? Where do private label bulbs belong? Will manufacturers be the only ones reporting? (4)</p>	<p>The producer is the typically the first seller in the province and could be the manufacturer, distributor, brand-owner importer or retailer. The program uses the definition of producer shown in the BC regulation and regulation guide. (Appendix G)</p>
<p>What will they have to report on? It is cumbersome for retailers to report BC sales by brand sales to manufacturers. The manufacturers have different programs in most provinces and deal with different stewardship plans according to the province. One preference for quarterly reporting. (4)</p>	<p>Producers will have to report monthly on their sales of program products in BC. Efforts will be made to minimize the administration burden faced by producers while still meeting the program goals and the regulatory requirements. (Sample in Appendix C)</p>
<p>Will there be an eco-fee to fund the program or are manufacturers expected to fund it? Will the fees be visible or included in the product cost? Support for both visible and non-visible fees. (4)</p>	<p>Producers will pay the fees to fund the program. It will be up to them if they choose to pass those costs along. The plan states that the fees may be visible or included in the product cost. If the producer chooses to show the fee, the wording is up to the producer, though the program will consider some recommended language examples. If there are visible fees, the required financial audit statements will be prepared and included in the annual report. It should not be shown as a tax as this is not accurate and has confused consumers in other jurisdictions. (5.5)</p>
<p>If there is a fee at the retail level, is there a risk that the ICI sector will pay but not receive the service?</p>	<p>There are different sales channels for the majority of products sold to the ICI sectors so this should not be a significant issue with this program and not an issue once the ICI program is implemented.</p>
<p>How will fees be determined and will they</p>	<p>Stewardship plans in BC do not</p>

<p>be available for consultation? The plan should include a budget and a fee setting policy. Producers should be consulted on these. What are the fees based on? Is there a possibility that producers will collect fees intended for the stewardship program, but not all funds will make it into the program's coffers? (2)</p>	<p>usually contain the budget to allow flexibility in making changes over the five year span of the plans. The fees are based on the program costs for all aspects of the program and the forecasted sales volumes. Fees may be adjusted over time based on actual expenses and revenue. The program will be administered by a non-profit organization ensuring that all fees are used for program needs (i.e. no profit). The Board of the non-profit organization will consist of producer members.</p>
<p>Will there be publicly available financial audits of the program if there is no eco-fee.</p>	<p>Required financial information will be part of the annual reports. (Appendix E)</p>
<p>Retailers should be represented on the board of the stewardship agency.</p>	<p>The board will be made up of producers (some retailers may be eligible as producers).</p>
<p>The importance of a level playing field for all producers. (4)</p>	<p>This plan has been created on behalf of EEMAC members (which represent some but not all manufacturers) but is intended to meet the needs of all producers. Producers will be contacted to invite them to join the program. Producers who do not join the program will still need to meet the requirements of the regulation and the responsibility of the BC Ministry of Environment to enforce this. Information on what producers and brands are registered with the program will be listed on the program website. Further details on this are in section 5.5.</p>
<p>What will be the turnaround time from reporting to the Ministry of Environment and the actual enforcement? Will they have more compliance officers to ensure US companies don't put companies here at a disadvantage?</p>	<p>This is a question better suited to a Ministry representative.</p>
<p>How do you plan to communicate with IC&I for those products?</p>	<p>There will be a separate program for ICI lamps.</p>
<p>Other</p>	
<p>Interest in developing municipal waste</p>	<p>The program wishes to participate in</p>

audit format that is useful to stewards and shares the costs.	those discussions.
Will lamps be banned from landfill? (2)	Landfill bans are determined by local governments. The program would only advocate for them in regions once there are adequate collection facilities in that region.
Will the audits be conducted on the recovered materials or sales? Will there be audits of the collection sites? (3)	Audits will be conducted on all aspects of the program, from reporting and collections to processing and downstream material sales. (5.1, 5.2, 6.3)
The collection amounts/targets may be low. (3)	The program recognizes this and intends to set targets once more experience is gained. See 7.1.
Will consumers hoard lamps in anticipation of a program?	With the existence of some collection capacity within BC already, a large volume of hoarded material is not anticipated.

Appendix G. Definitions & Abbreviations

Capture Rate -the amount of material collected by an EPR program divided by the amount of product discarded in the same year

Lamps –A lamp is a replaceable component such as a ... light bulb, which is designed to produce light from electricity.¹⁷ This may commonly be referred to as a “light bulb”.

Producer - The product producer is principally the first-seller of the product in the province. In practice the producer is typically the product manufacturer, distributor or brand-owner. The producer could also be an importer, broker or retailer who sells the product directly to a consumer. (BC Recycling Regulation Guide)

Recovery Rate -comparing present year collections to present year sales

CCME	Canadian Council of Ministers of the Environment
CFL	Compact Fluorescent Lamps
EEMAC	Electrical Equipment Manufacturers Association of Canada
HID	High-Intensity Discharge –a type of lamp
ICI	Institutional, Commercial and Industrial sector
LED	Light-emitting Diode
RCBC	Recycling Council of British Columbia

¹⁷ From Wikipedia [http://en.wikipedia.org/wiki/Lamp_\(electrical_component\)](http://en.wikipedia.org/wiki/Lamp_(electrical_component))

Appendix H. BC Recycling Regulation Requirements

Recycling Regulation Requirement section 5	Plan sections
1.(a) the plan will achieve, or is capable of achieving within a reasonable time,	---
(i) a 75% recovery rate or a higher recovery rate established by the director,	---
(A) for each subcategory listed in section 4 of Schedule 1 for the beverage container product category, and	NA
(B) for each product category covered by the plan, other than the beverage container product category, if required by the director,	7.1
(ii) any performance requirements or targets established by the director, and	NA
(iii) any performance requirements or targets in the plan,	7
(b) the producer has undertaken satisfactory consultation with stakeholders prior to submitting the plan for approval and will provide opportunity for stakeholder input in the implementation and operation of the product stewardship program, and	8
(c) the plan adequately provides for	---
(i) the producer collecting and paying the costs of collecting and managing products within the product category covered by the plan, whether the products are currently or previously sold, offered for sale or distributed in British Columbia,	5.5
(ii) with respect to the solvent and flammable liquids, pesticide, gasoline and pharmaceutical product categories,	NA
(iii) reasonable and free consumer access to collection facilities,	5.1
(iv) making consumers aware of	---
(A) the producer's product stewardship program,	5.4
(B) the location of collection facilities, and	5.4
(C) how to manage products in a safe manner,	5.4
(v) assessing the performance of the producer's product stewardship program, the management of costs incurred by the program and the management of environmental impacts of the program,	6, 7
(vi) a dispute resolution procedure for disputes that arise between a producer and person providing services related to the collection and management of the product during implementation of the plan or operation of the product stewardship program,	5.5
(vii) eliminating or reducing the environmental impacts of a product throughout the product's life cycle, and	5.3
(viii) the management of the product in adherence to the order of preference in the pollution prevention hierarchy.	5.3
(2) In deciding whether to approve the plan, the director may consider any of the following:	---
(a) the advice of a committee of up to 12 persons the director appoints for the purpose of giving advice on the plan;	NA
(b) the timelines and effectiveness of the plan respecting the matters referred to in subsection (1);	1
(c) the population and geographical area of the markets in which the producer sells, offers for sale or distributes the product;	4.1
(d) the manner in which the product is marketed and retailed by the producer;	4.1
(e) the nature of the product;	3
(f) the amount of product the producer expects to sell or distribute each year;	4.1

(g) the amount of product the producer expects to collect each year;	4.2, 7.1
(h) the size of the population intended to be served by each collection facility;	5.1, 7.3
(i) the provision of convenient options for the collection of products in urban centres and small, isolated communities, and for persons with disabilities or who have no access to transportation;	5.1
(j) the manner, kind and amount of advertising and consumer education planned by the producer to inform consumers of the location and operation of collection facilities and the environmental and economic benefits of participating in the product stewardship program;	5.4
(k) the methods of product collection, storage, transportation and management;	5.1, 5.2
(l) the product stewardship programs of other producers for products in the same product category;	NA
(m) the structure of financial and operational co-operation with other producers.	NA
(3) For the purposes of subsection (1) (c) (viii), the pollution prevention hierarchy is as follows in descending order of preference, such that pollution prevention is not undertaken at one level unless or until all feasible opportunities for pollution prevention at a higher level have been taken:	---
(a) reduce the environmental impact of producing the product by eliminating toxic components and increasing energy and resource efficiency;	5.3
(b) redesign the product to improve reusability or recyclability;	5.3
(c) eliminate or reduce the generation of unused portions of a product that is consumable;	5.3
(d) reuse the product;	5.3
(e) recycle the product;	5.3
(f) recover material or energy from the product;	5.3
(g) otherwise dispose of the waste from the product in compliance with the Act.	5.3