

DRAFT
**Permanent Regional Compact Fluorescent Lamp Recycling
Program Overview**

February 27, 2003

Background

Compact fluorescent lamps (CFLs) have been widely promoted by electric utilities and energy efficiency groups because they produce the same amount of light as standard incandescent bulbs while using up to 75% less energy and lasting up to ten times as long. During the energy crisis of 2001, millions of CFLs were sold in stores and given away by electric utilities in Oregon, Washington and Idaho. CFLs help reduce the pollution associated with energy production, but because they also contain about 5 mg of mercury per bulb, it is important that they be disposed of properly. Mercury is toxic to the human nervous system, especially for fetuses and young children. Once released into the environment it can accumulate in the tissues of living organisms and travel up the food chain where it reaches high concentrations in fish and other marine life. Proper recycling can easily eliminate these risks.

Purpose of the CFL Recycling Project

- To provide a multi stakeholder process for planning a state/region wide CFL recycling program model
- To evaluate alternative CFL recycling models
- To encourage the safe use of energy efficient products
- To increase economic activity from CFL recycling
- To reduce amounts of one of the sources of mercury to landfills
- To protect the environment for human and ecosystem health

A permanent regional compact fluorescent lamp recycling program is needed to provide for responsible management of burned out residential CFLs to minimize the risks posed by this anthropogenic source of mercury. A program focusing on CFLs from households is needed to compliment the collection and recycling efforts centered on commercial sources. This permanent program will be a logical follow-on to a pilot project¹ (depending on pilot results) that demonstrates successful collection of burnout CFLs through retailer sites. The CFL Stakeholder Group² has been reviewing program options for the capture and processing of CFLs and potential funding mechanisms for such a permanent regional program to help ensure the responsible end-of-life management of these lamps.

The CFL Stakeholder Group consists of organizations that include electric utilities, private businesses, government agencies, industry associations, consulting firms, recyclers and non-profit

¹ See Zero Waste Alliance draft paper “Compact Fluorescent Lamp Recycling Pilot Project Overview”

² The CFL Stakeholder Group is a multi stakeholder group that was convened by the Zero Waste Alliance under funding from Bonneville Power Administration, Clark Public Utility District, Eugene Water and Electric Board, Metro Region Government, Northwest Energy Efficiency Alliance, Oregon Department of Environmental Quality, PacifiCorp, and Portland General Electric.

groups. The participants are committed to developing a pilot project in Oregon and/or Washington to test CFL collection and recycling methods with the intent that it may lead to a permanent regional recycling system. This has been a public process open to additional groups that wish to join. The participants of this group have agreed to the following objectives to guide the design and implementation of such a system:

CFL Recycling Project Principles

- **Environmental Protection:** Primary goal is to avoid mercury buildup in the environment associated with the use of CFLs. A specific project goal is to avoid mercury emission during the collection, transportation and recycling of the CFLs.
- **Easy Access:** The recycling system should allow the public to easily recycle their CFLs by providing the most convenient recycling opportunities possible
- **Low Cost:** The costs of the recycling system, such as collection, transportation and recycling, should be minimized.
- **Fair Cost Allocation:** The costs of the recycling system should be allocated fairly so as to minimize impacts to manufacturers, retailers, waste handlers, state and local government and other involved in the collection, transportation and recycling of CFLs.
- **Compliance:** The recycling program must provide for compliance with all applicable regulations, such as RCRA, CERCLA, state solid waste regulations and the Universal Waste Rule.
- **Education:** Education and public outreach are vital components of a successful CFL recycle program. They should point out that CFLs are safe in the home and provide an overall environmental benefit, but if not handled and recycled properly can create environmental and human health impacts.
- **Replicable:** To the extent possible, the program will be designed so that after its implementation in Oregon, it can be easily replicated in other areas, especially in the Western United States.
- **Expandable:** CFLs are only one of several sources of potential mercury emissions. To the extent possible, this program should be expandable so that it may later include the collection and recycling of other mercury bearing items, including increased recycling levels for fluorescent light tubes.
- **Recycling System:** The participants are committed to developing a pilot project to test CFL collection and recycling methods with the intent that it will lead to a sustained recycling system.
- **Sustainable:** the group as a whole should design the system so that it can sustain itself without ongoing involvement.

This paper is a summary description of the long-term program as the Group currently sees it. This description is expected to change based on Group discussions in meeting three of Phase II and on results from a pilot program that has been planned, but is not funded at the time of this writing.

Material Considerations

Material Flow

The fundamental flow of material in a regional program will be: from manufacturer to retailer for sale to consumers; then back to the retailer for collection and transportation to a recycling facility. A CFL purchaser uses the CFL till it burns out. At that time the CFL user takes the CFL to a retailer participating in the recycling program. The CFL user then either deposits the burnout CFL into a “Do-It-Yourself” collection bin, or gives it to a retailer employee for deposit. When the retailer collects a certain number of burned out CFLs, a recycler will make a pickup and transport the lamps to a facility for recycling.

It is important that burned out CFLs are separated from early failures that are still covered under warranty, as Northwest Energy Efficiency Alliance is currently running a Residential Lighting program with Energy Star – a component of which emphasizes the need for consumers to return CFLs that fail prematurely to retailers for a replacement.

Quantities Expected

Total sales for the region are based on the seven-quarter period from fourth quarter 2000 to second quarter 2002. This sales data is available by county. CFL sales are projected to level off to around 1,000,000 per year from 2003. Approximately 56.8% of the CFLs sold in the region are located in Washington state, 29.2% in Oregon, 9.9% in Idaho, and 4.0% in Montana. The majority of sales throughout the region occurred in the most heavily populated counties.³

Based on pre-2003 sales data, annual CFL failures are projected to increase until 2007, at which time they peak at approximately 2,500,000; and then level off to 999,800 per year from 2009. This peak is largely due to utility promotion of CFL sales and give-away programs during the 2000-2001 energy crisis. Total CFL failures for the region for years 2004-2009 is estimated at 11,214,158.⁴ See the CFL Sales and Projected Failures Calculations section for additional information.

Financial Considerations

Anticipated Program Costs

It is difficult to estimate costs of a regional on-going recycling program without knowing locations of retailer sites, how many retailer sites will participate, CFL recovery rate, recycling costs per lamp, number of pickups per store, extent of education outreach and advertising. Additionally, it is unknown at which level the program will be implemented, i.e., regional, state, local. Assumptions were made for these ‘unknowns’, including project management costs. Costs would likely be defrayed if fluorescent tubes were included in collection efforts.

For the purposes of this paper, total annual regional program management costs are estimated at \$110,000 for three full time employees and \$100,000 for other variable and fixed costs. Ongoing advertising costs are estimated at \$10,000-\$25,000 per subregion (i.e., subregions for Oregon: Willamette Valley, Portland, Eastern, Coast). Advertising costs after the first six months are expected to decrease significantly after the initial campaign. Total 2004-2009 recycling costs estimates range from \$780,000 to \$4,200,000, based on recovery rates of 20% and 50% and recycling cost

³ Source: EcoNorthwest/Northwest Energy Efficiency Alliance

⁴ Source: Northwest Energy Efficiency Alliance

assumptions of \$0.35 and \$0.75 per lamp. See store location scenarios for the region at the end of this paper for further estimates.

Costs of implementing a regional program up until 2007 would be more expensive than after 2007, as this is the year when the region experiences a peak in burnouts. This is the period in which recycling and transport costs would increase. Based on future sales and failure projections, program costs after 2007 should remain fairly constant. It is likely that an Advanced Recovery Fee would be introduced after 3-5 years to sustain collection and recycling efforts.

The estimated annual program costs (based on CFL sales and failures projection for 2004-2009) is \$640,000, assuming the following:

- Recovery rate of 20% at a recycling cost of \$0.35 per lamp (\$130,000),
- 13 subregions participating throughout OR, WA, ID, MT,
- Project management and other related costs of \$210,000,
- Average advertising costs of \$15,000-\$25,000 per subregion, (\$195,000-\$325,000)
- Transport costs of \$2,700 per subregion (Costs increase for areas outside of main transit corridors and as recovery rate increases. It is considered that transport costs are included otherwise. (\$35,000))

Note: All costs in the example are to serve only as a starting point in facilitating discussion in estimating program costs. It is assumed that these cost estimates may change as the pilot is further developed.

Funding Sources

A funding mechanism will have to be eventually established, as it is unlikely to expect that legislation, such as a landfill ban, will be passed in the foreseeable future to support a regional program. One option is to gradually introduce fees (Advanced Recovery) to consumers over a period of 3-5 years. During this time, seed funding would be required to promote program activities and deal with legacy products (i.e., CFLs in use and burnout stream).

One option for seed funding is through energy organizations funded by utilities such as Northwest Energy Efficiency Alliance and The Oregon Energy Trust. Both organizations have strategies and programs that align well with long term CFL recycling (i.e., energy savings and new technology promotion through market transformation). Another option for partial funding is through local, state and/or regional government – depending on the size and structure of the program. Regardless of the option, ultimately, CFL users will be responsible for funding the operation of a regional program.

Costs of a future regional program may be greatly reduced, if not met, through an Advanced Recovery Fee. Coupon incentives may aid in informing the public as to the need/cost of recycling CFLs. Utilities could include a coupon with their bills that allows a customer to return a burned out CFL at no recycling charge (free) to participating retailer sites. This acclimates users to the idea of associated recycling fees so that later, if and when an Advanced Recovery Fee is imposed, they understand why; and the benefits of CFLs are ensured. Additionally, when CFL users deposit their burnout CFLs at retailers, they may receive a coupon to purchase a new CFL at reduced cost, thereby promoting continued lamp sales and energy savings.

Financial Flow

There are many options for financial flow in a regional recycling program. As previously mentioned, the user may pay an Advanced Recovery Fee (with or without a deposit) to cover collection and

recycling costs. Alternatively, CFL purchasers may pay an End-of-Life Recovery Fee; or the recycling costs may be passed on to consumers via the retailer through a producer paid model. Regardless of fee structure, the customer may also receive a coupon for purchase of a new CFL at reduced cost; or coupons from manufacturers for new lamps, the value of which equals the disposal fee.

The Group will not formally confirm a model for the permanent program in Phase II meetings. Discussion on financial flow, and funding mechanisms (models) that were reviewed by the Group and may be appropriate for a permanent program, will be included in the CFL Recycling Project final report by the Zero Waste Alliance. Results of a pilot project(s) are expected to provide useful recommendations in this area as well.

Management of Program

Structure

The structure of a regional program is undetermined, though could be set-up in a number of ways. It could be structured so that local governments contract through recyclers for collection at retailer sites for individual cities/communities. Or, a new state or regional organization could be created (or an existing regional organization could be utilized) to coordinate the collection efforts for individual states and the region. Alternatively, if large retailers participate in the program and are located region-wide, they could manage the program if it suits their long term strategies.

In Minnesota, where small retailers serve as collection points for burned out CFLs, one mercury recycler manages the program statewide. Should small retailer sites dominate a Pacific Northwest regional recycling effort, program activities could be community centered, with local agencies eventually directly managing the recycling program.

Another option is to establish an industry backed organization dedicated to recycling CFLs, much in the way the Rechargeable Battery Recycling Corporation (RBRC) is dedicated to recycling rechargeable batteries. RBRC is a nonprofit public service organization supported by over 300 manufacturers. They provide collection materials and pays recycling costs. Businesses participating in the program cover shipping/transport costs.

A regional program may ensure that all areas are uniformly served, whereas, community based approaches may be either more or less effective at championing recycling efforts.

Management

Depending on the structure of a regional program, management requirements will differ. If a program is managed by a local, state or regional agency or organization, oversight responsibilities may be incorporated into existing job descriptions. This type of set-up may be difficult to coordinate on a regional level, but it may allow for greater flexibility during program implementation. Establishing a new regional organization, or several state organizations to manage a program will entail greater costs, but may allow for more consistency in implementation and equal coverage in all subregions. Alternatively, if a large retailer championed the program, implementation costs would likely decrease and greater consistency would be attained regionally, and potentially nationally.

Costs

Annual program management costs are estimated at \$110,000 for three full time employees and \$100,000 for other variable and fixed costs. These costs may decrease if the program is implemented by an existing organization. Overall it is difficult to predict costs because the structure and extent of a regional program is as of yet undetermined. Additional personnel may be required to manage implementation, depending on how many retailer sites and subregions are included in a program. If a national RBRC type organization was established these costs would be borne by manufacturers.

Sample Budget Estimate

In the sample budget below, recycling costs are a major cost for a regional recycling program. Depending on recovery rate and recycling costs per lamp, the total annual estimates for recycling range from approximately \$130,000 to \$700,000. A pilot project may help predict recovery rates for a regional program. Project management, fixed and variable costs are consistent despite varying recovery rates but ultimately depend on the breadth of the program. Advertising costs will also vary depending on locations, how many retailers participate and which media sources are used to market the program to the public. It is assumed that advertising costs will decrease dramatically after the initial campaign. In the budget, advertising for the 2004-2009 period is estimated at half the initial campaign costs. The budget below is to be considered only as a starting point for estimating costs of a regional program.

Sample Budget Estimate

Sample Budget Estimate - Regional Program							
Activity		Annual Cost @ 20% recovery @ \$0.35/lamp	Annual Cost @ 35% recovery @ \$0.50/lamp	Annual Cost @ 50% recovery @ \$0.75/lamp	2004-2009 Cost @ 20% recovery @ \$0.35/lamp	2004-2009 Cost @ 35% recovery @ \$0.50/lamp	2004-2009 Cost @ 50% recovery @ \$0.75/lamp
Project Management	1 Senior Staff	\$50,000	\$50,000	\$50,000	\$300,000	\$300,000	\$300,000
	Phase I-IV	\$30,000	\$30,000	\$30,000	\$180,000	\$180,000	\$180,000
	1 Staff/Clerical	\$30,000	\$30,000	\$30,000	\$180,000	\$180,000	\$180,000
Proj Mngt Total		\$110,000	\$110,000	\$110,000	\$660,000	\$660,000	\$660,000
Advertising							
	Per *subregion	\$20,000	\$20,000	\$20,000	\$60,000	\$60,000	\$60,000
Advert Total		\$260,000	\$260,000	\$260,000	\$780,000	\$780,000	\$780,000
Recycling							
		\$130,439	\$326,098	\$698,782	\$782,636	\$1,956,590	\$4,192,693
Transport							
	Per *subregion	\$2,700	\$4,000	\$6,000	\$16,200	\$24,000	\$36,000
Transport Total		\$35,100	\$52,000	\$78,000	\$210,600	\$312,000	\$468,000
Other							
	Fixed/Variable	\$100,000	\$100,000	\$100,000	\$600,000	\$600,000	\$600,000
Total		\$635,539	\$848,098	\$1,246,782	\$3,033,236	\$4,308,590	\$6,700,693
*Subregion (e.g., Willamette Valley, Portland Metro, Coast, Eastern)							

Summary

A regional CFL program is a logical next step consideration following a pilot project. It is important that the 11 million residential CFL burnouts projected in the coming years are managed responsibly at their end of life to ensure that this source of mercury is captured and prevented from entering the environment. A pilot project provides a means for evaluating the effectiveness of a new system for recycling CFL burnouts from residents that may lead to establishing a permanent regional program – as household hazardous wastes facilities are not experiencing significant numbers of CFL returns from households. The majority of the CFLs in use in the region are in the larger metropolitan areas. Collection through retailer sites provides a convenient method for return of burned out CFLs. An effective regional program would likely expand to include fluorescent tubes generated by households, in addition to CFLs, thereby providing greater overall benefits from the management costs.

There are several options for covering regional program costs. One option is to gradually introduce fees (e.g., Advanced Recovery) over 3-5 years to cover regional program costs. Seed funding would be required to illustrate and promote the importance of recycling and use of CFLs, and to cover legacy products. Seed funding may be available through regional energy organizations promoting energy efficient products through market transformation. Local and state governments may also play a role in coordinating a regional recycling program, with CFL users ultimately supporting the program financially through a fee system.

Program costs are difficult to determine without knowing which subregions would be included, the number of retailer sites that may participate in the program, the CFL recovery rate, or the extent of program promotion and education outreach. Modest estimates place total annual program costs at roughly \$640,000 and total 2004-2009 regional program costs at \$3,000,000 (costs mainly depending on recycling costs estimates and recovery rates).

Summary Table

Location	Regional: OR, WA, ID, MT		
Population	OR 3,472,867; WA 5,987,973; ID 1,321,006; MT 904,433		
Estimated CFLs sales Q4 2000 – Q2 2002 by state <i>Source: EcoNorthwest/NEEA</i>	OR 2,892,544 (29.2%) WA 5,625,897 (56.8%) ID 981,742 (9.9%) MT 400,210 (4.0%)		
Retailers (potential participants)	<u>Large:</u> Fred Meyer, Home Depot, Lowe's <u>Small:</u> Do-It-Best Hardware, Ace Hardware, True Value Hardware, A-Boy Electric		
Recyclers	Earth Protection Services Environmental Protective Services Total Reclaim / EcoLights Northwest		
Timeframe	Ongoing 2004-2009		
Sample Metrics	# CFLs collected by type/mo/qtr; Store; Store zip code		
Projected Failures 2004-2009 for region	11,180,516 1,863,419/yr average		
2004-2009 Recycling Costs	Recycling costs 2004-2009 assuming 20% recovery @ \$0.35/lamp \$782,636 \$130,439/yr average	Recycling costs 2004-2009 assuming 35% recovery @ \$0.50/lamp \$1,956,590 \$326,098/yr average	Recycling costs 2004-2009 assuming 50% recovery @ \$0.75/lamp \$4,192,694 \$698,782/yr average
Estimated Total Annual Program Cost	\$640,000 - \$1,200,000		
Estimated 2004-2009 Total Program Costs	\$3,000,000 - \$6,700,000		

Store Location Scenarios

The following tables present potential scenarios for a regional recycling program. These tables are meant to serve only as a starting point in developing a regional program and estimating costs. Data pertaining to sales is available by county from the seven-quarter period from fourth quarter 2000 to second quarter 2002⁵. Because this is the period during which the majority of sales took place for the region, counties that experienced the greatest percentage of sales were included in the scenario tables below for the year 2004. It is important to note that CFL failures in the subregions would increase up to year 2007 when projected failures peak⁶. Assumptions were made concerning the number of participating stores, transport costs, and number of lamps per pickup. The number of burned out CFLs per pickup was assumed to be around 1,000 (2-4 bins @ 250/500 CFLs/bin).

OREGON	Sub-regions			
29.20%	Portland Metro	Willamette Valley	Coast	Eastern
County	Washington Multnomah Clackamas	Marion Lane Linn	Clatsop Coos Jackson	Deschutes Umatilla
City	Portland Gresham Tualatin Oregon City Hillsboro	Salem, Eugene Lebanon, Albany Sweet Home	Astoria, Seaside Coos Bay, Ashland Medford	Bend Pendleton
# Projected Burnouts 2004	524,721*44.3% = 232,451	524,721*26.3% = 138,002	524,721*10.5 = 55,096	524,721*6% = 31,483
Assuming 35% Recovery	81,358	48,301	19,284	11,019
# Participating Stores	10	10	8	5
# Estimated Annual Pickups	7	5	3	3
# CFLs per Pickup per Store	1,162	966	803	735
Annual Transport Cost	\$3,500	\$3,750	\$1,800	\$1,875
Recycling Cost per Pickup assuming \$0.35/lamp	\$407	\$338	\$281	\$257
Recycling Cost per Pickup assuming \$0.50/lamp	\$581	\$483	\$402	\$367

WASHINGTON	Sub-regions				
56.80%	Olympic	Northwest	Southwest	Central	Eastern
County	Kitsap Thurston Pierce Clallam	King Snohomish Whatcom	Clark	Douglas Yakima	Spokane Benton
City	Seattle Olympia Tacoma Pt. Angeles	Seattle Everett Bellingham	Vancouver	Wenatchee Yakima	Spokane Kennewick
# Projected Burnouts 2004	1,027,729* 18.2% = 187,047	1,027,729* 50.1% = 514,892	1,027,729* 3.6% = 36,998	1,027,729* 4.5% = 46,248	1,027,729* 12.8% = 131,549
Assuming 35% Recovery	65,466	180,212	12,949	16,187	46,042
# Participating Stores	10	15	5	5	8
# Estimated Annual Pickups	6	12	3	3	5
# CFLs per Pickup per Store	1,091	1,001	863	1,079	1,151
Annual Transport Cost	\$3,000	\$9,000	\$1,125	\$1,500	\$5,000
Recycling Cost per Pickup assuming \$0.35/lamp	\$382	\$350	\$302	\$378	\$403
Recycling Cost per Pickup assuming \$0.50/lamp	\$546	\$501	\$432	\$540	\$576

⁵ EcoNorthwest/Northwest Energy Efficiency Alliance

⁶ Northwest Energy Efficiency Alliance

IDAHO	Sub-regions	
9.90%		
	North	South
County	Kootenai	Ada Twin Falls Bonneville
City	Coeur d'Alene	Boise Twin Falls Idaho Falls
# Projected Burnouts 2004	179,129*11.9 = 21,316	179,129*75.5% = 135,242
Assuming 35% Recovery	7,461	47,335
# Participating Stores	2	8
# Estimated Annual Pickups	4	6
# CFLs per Pickup per Store	933	986
Annual Transport Cost	\$600	\$3,600
Recycling Cost per Pickup assuming \$0.35/lamp	\$326	\$345
Recycling Cost per Pickup assuming \$0.50/lamp	\$466	\$493

MONTANA	Sub-regions	
4.00%		
	West	East
County	Flathead Missoula	Yellowstone
City	Kalispell Missoula	Billings
# Projected Burnouts 2004	72,375*36.5% = 26,417	72,375*23.2% = 16,791
Assuming 35% Recovery	9,246	5,877
# Participating Stores	4	2
# Estimated Annual Pickups	2	3
# CFLs per Pickup per Store	1,156	979
Annual Transport Cost	\$600	\$450
Recycling Cost per Pickup assuming \$0.35/lamp	\$405	\$343
Recycling Cost per Pickup assuming \$0.50/lamp	\$578	\$490

Estimated Permanent Regional Program Timeline

Although it is not clear what type of implementation structure/schedule a regional program would take, the pilot project should provide lessons learned that would shape the permanent program. It is likely that a regional program would be managed similarly to a pilot project, depending on the pilot's success; and consist of the following phases:

- Phase I: Building and fostering relationships with pilot project participants and developing a promotion plan and materials
- Phase II: Organizing pilot project(s) promotion and start-up / kick-off event(s)
- Phase III: Ongoing managing of pilot project(s) activities
- Phase IV: Evaluating and reporting on pilot project progress and results

These phases are represented in the timeline below for years 2005-2009, after which time a fee structure would be in place to sustain the program.

Estimated Permanent Regional Program Timeline

Compact Fluorescent Lamp Recycling Project

Activity	Year/Quarter																			
	2005				2006				2007				2008				2009			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Phase I: Building and fostering relationships with program participants and developing a promotion plan and materials																				
Recruit program participants																				
Set up telephone/web support for CFL users with questions and information																				
Establish protocols for distributing program funds																				
Update measuring system																				
Phase II: Organizing program promotion and start-up/kick-off event(s)																				
Adapt advertising and marketing strategies																				
Determine location of recycling bins, signage, information at retailer																				
Scheduling pickups for recycling bins by recycler																				
Program promotion																				
Hold kick-off events																				
Collaborate with community/special interest groups																				
Phase III: Ongoing managing of program activities																				
Manage day-to-day program activities																				
Store / Recycler liaison																				
Data collection																				
Reporting																				
Phase IV: Evaluating and reporting on program progress and results																				
Evaluate program results and report																				
Prepare final program report with recommendations																				

CFL Sales and Projected Failures Calculations – Regional Program

CFL Sales and Projected Failures - Regional Program															
<i>Source: EcoNorthwest/NEEA</i>															
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total	2004-2009
Number of CFLs sold by region	204,000	237,233	324,431	578,980	8,454,803	2,500,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	19,299,447	6,000,000
Total Projected CFL failures for region	25,500	55,154	95,708	168,081	1,233,417	1,555,786	1,694,282	1,809,382	2,246,578	2,420,028	2,490,170	1,248,200	999,800	16,042,086	11,214,158
Total Projected CFL failures by state															11,202,944
OR (29.2%)	7,446	16,105	27,947	49,080	360,158	454,290	494,730	528,340	656,001	706,648	727,130	364,474	291,942	4,684,289	3,274,534
WA (56.8%)	14,484	31,327	54,362	95,470	700,581	883,686	962,352	1,027,729	1,276,056	1,374,576	1,414,417	708,978	567,886	9,111,905	6,369,642
ID (9.9%)	2,525	5,460	9,475	16,640	122,108	154,023	167,734	179,129	222,411	239,583	246,527	123,572	98,980	1,588,167	1,110,202
MT (4.0%)	1,020	2,206	3,828	6,723	49,337	62,231	67,771	72,375	89,863	96,801	99,607	49,928	39,992	641,683	448,566
Total Region Recycling Cost assuming 20% @ \$0.35/lamp	\$1,785	\$3,861	\$6,700	\$11,766	\$86,339	\$108,905	\$118,600	\$126,657	\$157,260	\$169,402	\$174,312	\$87,374	\$69,986	\$1,122,946	\$784,991
OR (29.2%)	\$521	\$1,127	\$1,956	\$3,436	\$25,211	\$31,800	\$34,631	\$36,984	\$45,920	\$49,465	\$50,899	\$25,513	\$20,436	\$327,900	\$229,217
WA (56.8%)	\$1,014	\$2,193	\$3,805	\$6,683	\$49,041	\$61,858	\$67,365	\$71,941	\$89,324	\$96,220	\$99,009	\$49,628	\$39,752	\$637,833	\$445,875
ID (9.9%)	\$177	\$382	\$663	\$1,165	\$8,548	\$10,782	\$11,741	\$12,539	\$15,569	\$16,771	\$17,257	\$8,650	\$6,929	\$111,172	\$77,714
MT (4.0%)	\$71	\$154	\$268	\$471	\$3,454	\$4,356	\$4,744	\$5,066	\$6,290	\$6,776	\$6,972	\$3,495	\$2,799	\$44,918	\$31,400
Total Region Recycling Cost assuming 35% @ \$0.50/lamp	\$4,463	\$9,652	\$16,749	\$29,414	\$215,848	\$272,263	\$296,499	\$316,642	\$393,151	\$423,505	\$435,780	\$218,435	\$174,965	\$2,807,365	\$1,962,478
OR (29.2%)	\$1,303	\$2,818	\$4,891	\$8,589	\$63,028	\$79,501	\$86,578	\$92,459	\$114,800	\$123,663	\$127,248	\$63,783	\$51,090	\$819,751	\$573,043
WA (56.8%)	\$2,535	\$5,482	\$9,513	\$16,707	\$122,602	\$154,645	\$168,412	\$179,853	\$223,310	\$240,551	\$247,523	\$124,071	\$99,380	\$1,594,583	\$1,114,687
ID (9.9%)	\$442	\$956	\$1,658	\$2,912	\$21,369	\$26,954	\$29,353	\$31,348	\$38,922	\$41,927	\$43,142	\$21,625	\$17,322	\$277,929	\$194,285
MT (4.0%)	\$179	\$386	\$670	\$1,177	\$8,634	\$10,891	\$11,860	\$12,666	\$15,726	\$16,940	\$17,431	\$8,737	\$6,999	\$112,295	\$78,499
Total Region Recycling Cost assuming 50% @ \$0.75/lamp	\$9,563	\$20,683	\$35,891	\$63,030	\$462,531	\$583,420	\$635,356	\$678,518	\$842,467	\$907,511	\$933,814	\$468,075	\$374,925	\$6,015,782	\$4,205,309
OR (29.2%)	\$2,792	\$6,039	\$10,480	\$18,405	\$135,059	\$170,359	\$185,524	\$198,127	\$246,000	\$264,993	\$272,674	\$136,678	\$109,478	\$1,756,608	\$1,227,950
WA (56.8%)	\$5,432	\$11,748	\$20,386	\$35,801	\$262,718	\$331,382	\$360,882	\$385,398	\$478,521	\$515,466	\$530,406	\$265,867	\$212,957	\$3,416,964	\$2,388,616
ID (9.9%)	\$947	\$2,048	\$3,553	\$6,240	\$45,791	\$57,759	\$62,900	\$67,173	\$83,404	\$89,844	\$92,448	\$46,339	\$37,118	\$595,562	\$416,326
MT (4.0%)	\$383	\$827	\$1,436	\$2,521	\$18,501	\$23,337	\$25,414	\$27,141	\$33,699	\$36,300	\$37,353	\$18,723	\$14,997	\$240,631	\$168,212