



April 12, 2013
REPORT #E13-253

The Current State of Lighting Retrofit Programs and Standard Project Practices in the Northwest Region

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EXECUTIVE SUMMARY

As part of the evaluation of the Comprehensive Commercial Lighting Initiative (CCLI), the Northwest Energy Efficiency Alliance (NEEA) funded a retrofit lighting market study to better understand the current state of lighting retrofit programs and standard project practice in the Northwest region (Idaho, Montana, Oregon and Washington). Heschong Mahone Group, Inc. (HMG) conducted the study in coordination with NEEA, and with survey assistance from Market Strategies International (MSI).

This study also identified barriers to widespread implementation of comprehensive lighting retrofit programs throughout the region. As a secondary goal, this report investigated market actors' expectations of new federal regulations that will effectively ban the sale of traditional T12 linear fluorescent lamps and ballasts.

This study involved three main tasks:

1. Review of Utility Lighting Programs, which included:
 - a. Review of Lighting Program Offerings – review online documentation describing the lighting retrofit program offerings of the various utilities in the Northwest region in order to help develop the utility program manager survey
 - b. Utility Program Manager Online Survey – work in coordination with NEEA and MSI to develop an online survey instrument for utility program managers in the region, and analyze the results
2. Lighting Project Review – review a sample of typical lighting retrofit projects to determine standard retrofit practices
3. Trade Ally Online Survey – work in coordination with NEEA and MSI to develop an online survey instrument for trade allies in the region, and analyze the results

Review of Utility Programs:

- ◆ **Review of the Lighting Program offerings** revealed the following characteristics:
 - Twenty-three of twenty-six retrofit programs offer fixed incentives for specific measures
 - Eight retrofit programs offer some form of custom incentives
 - Only two offer incentives based on energy savings (kWh)
- ◆ **The Utility Program Manager Survey** showed that all utility program managers are aware that the lighting retrofit market is changing due to new regulations such as the T12 phase-out, and that their programs will have to change along with it; however, most

(58%) have no specific plans as to how their programs will adapt to these changing market conditions. Utility program managers also report that a lack of trade ally expertise constitutes one of the key barriers to implementing more comprehensive lighting programs. Despite the need for, and importance of trade ally training, only about half of the utility program managers reported that they either currently offer, or would probably offer training on lighting retrofits. However, program managers most frequently (31%) cited regional coordination of training efforts among roles and strategies NEEA should pursue in support of commercial lighting retrofit programs.

Lighting Project Review: HMG reviewed a sample of fifty-two lighting retrofit projects from the Energy Trust of Oregon and Idaho Power territories. The projects reviewed consisted mainly of T12 (87%) and high-intensity discharge (HID) (51%) change-outs. Retrofits of older, less-efficient T8 technologies were always part of a project that also included T12 or HID replacements. Even the custom measures used in the reviewed projects were almost exclusively (93% of custom measures) T12, HID or incandescent replacements. Less than half of the reviewed projects involved any kind of controls. These findings suggest that trade allies tend to focus on fixed-incentive one-for-one equipment change-outs, and rarely consider project measures beyond the typical retrofit targets of T12, HID or incandescent lighting.

Trade Ally Online Survey: Seventy-six trade allies from thirty-eight different organizations in the region completed the online survey. The results of the survey indicated that retrofit practices and measures varied widely depending on building type. Trade allies were more likely to adjust fixture placement (72% at least half of the time) and include lighting controls (58% at least half the time) in warehouse projects. On the other hand, office and retail projects were less likely to involve advanced controls strategies or high performance fixture options. For example, 56% of trade allies reported installing occupancy sensors in open offices at least half the time, but only 21% reported installing daylighting controls in office spaces at least half the time. Similarly, 37% of trade allies reported using LED spotlights in retail applications at least half the time, and only 30% use automatic shut-off controls after retail store hours at least half the time. These results suggest that current retrofit practices may be more closely related to trade ally business models and program incentive structures than to limitations in trade ally experience or skill sets.

Overall, the findings indicated three primary barriers to widespread implementation of comprehensive lighting retrofit programs in the Northwest region:

- ◆ **Utility program uncertainty**

All utility program managers are aware that their lighting retrofit programs will have to change to address new federal regulations and the loss of savings from T12 change-outs, but most utility program managers (58%) have no specific plans as to how their programs will change to meet these future challenges.

Program managers are generally willing to transition toward more comprehensive program models (33% have already or would definitely consider providing increased incentives for comprehensive lighting retrofits), but uncertainty remains regarding how the utilities will implement these programs and how their customers and trade allies will

adjust to the greater complexity of these programs.

Recommendation: Utilities should actively plan for future program cycles in light of known policy changes. Whenever possible, future plans should be communicated to trade allies and customers in advance to adequately prepare the market.

- ◆ **Trade ally experience**

The results of this study suggest that trade ally experience and skill sets vary widely. Although some trade allies may be aware of more advanced control strategies and design-based retrofit approaches, they are using them sparingly in current retrofit projects (see Trade Ally Online Survey results, above).

Some trade allies may need more experience with new lighting technologies and controls strategies, while others may only need better training on how to sell these advanced strategies to their customers. In both cases, trade allies need more education and training to effectively deliver comprehensive lighting retrofit projects.

Recommendation: Widespread trade ally education should be a key priority for utilities and regional organization such as NEEA, in order to prepare trade allies for the more comprehensive lighting retrofits that will be required to achieve deep energy savings going forward.

- ◆ **Project costs, incentive structures and trade ally business models**

The lighting retrofit market in the Northwest appears heavily reliant on fixed incentives for prescriptive measures (one-for-one change-outs or control equipment installations). Ninety percent of survey respondents reported offering fixed incentives as part of their program portfolios. These types of programs are easy for utilities to implement and offer straightforward participation for customers and contractors. However, the results of this study suggest that trade allies may be unlikely to pursue deeper savings retrofit options, instead targeting the fixed-incentive measures that provide the best payback, and potentially missing other retrofit opportunities that standard program measures do not address.

These fixed incentives also do not always represent actual energy savings. For example, most utilities (64%) report that they offer the same fixed incentive rate for all control types in their standard programs. This creates the potential for incentivizing strategies that may not result in the most energy savings. Study results also indicate that the potential added project costs of more comprehensive lighting retrofits are a significant barrier for customers (68% of utility managers report that added cost is an very or extremely important barrier, and 76% of trade allies report that added cost is a barrier to their customers), even though those projects may provide deeper savings.

Recommendations:

- Utility incentive program structures should prioritize the deepest energy savings possible, rather than just encouraging the most straightforward retrofits. Incentives will need to encourage both the trade ally and the customer to strive for deeper savings by adequately rewarding the added effort and cost to achieve those savings. These incentive structures will necessarily be unique to each local utility territory, depending on local market forces such as utility rates and trade ally experience.
- Trade allies need to be adequately prepared to communicate the added benefits of comprehensive lighting retrofits, and the utility incentive programs and rates that support those retrofits. This will be a key feature of the trade ally education described above.

In addition to the market barriers listed above, this study also examined the role of NEEA in the energy efficient commercial lighting retrofit market:

◆ **Role of NEEA**

Responses to the utility program manager survey indicated that utility managers would most like NEEA to continue to support trainings and resources beneficial to and shared by all the utilities across the Northwest region. For example, 63% of respondents suggested that NEEA should work with distributors and manufacturers representatives to encourage comprehensive retrofits, and 60% suggested that NEEA should develop marketing tools to educate customers on the advantages of comprehensive retrofits. Actions such as directly developing programs at NEEA (only 35%) or providing marketing tools for “top performing” trade allies (23%) were less popular with the utility program managers

Recommendation: NEEA should focus future efforts on developing resources that can benefit the region as a whole, such as trainings and educational efforts. Due to the variations in local markets across the region, developing specific programs like CCLI may not be the best use of NEEA’s resources.

1. INTRODUCTION

In coordination with the evaluation of the Comprehensive Commercial Lighting Initiative (CCLI), the Northwest Energy Efficiency Alliance (NEEA) funded a retrofit lighting market study to better understand the current state of lighting retrofit programs and standard project practice in the Northwest region (Idaho, Montana, Oregon and Washington). Heschong Mahone Group, Inc. (HMG) conducted the study in coordination with NEEA, and with survey assistance from Market Strategies International (MSI).

This report provides a representation of the retrofit lighting market, and identifies barriers to widespread implementation of comprehensive lighting retrofit programs throughout the region. It includes findings from surveys of market actors, as well as a review of typical lighting retrofit projects. As a secondary goal, this report also investigated utility program manager and trade ally expectations of how the new federal regulations that intended to effectively ban the sale of traditional T12 linear fluorescent lamps and ballasts would impact their business models.

As part of the evaluation of this initiative, HMG evaluated the initiative's pilot program. Findings of this evaluation are in a separate report.

HMG also conducted a Retrofit Lighting Market Characterization study in conjunction with this study. A separate report presents the findings of that study.

1.1 Comprehensive Commercial Lighting Initiative

NEEA and utility stakeholders conceived the CCLI as a means to test a comprehensive retrofit offering that moved away from focusing on individual measures to an integrated, design-based approach that makes much greater use of lighting controls. In addition, the utilities offered tiered incentives on overall kWh reductions to encourage deeper energy savings instead of incentives per piece of equipment. To support this pilot, the CCLI provided in-depth training and tool development for participating trade allies, as well as one-on-one design support for individual projects conducted as part of the pilot programs.

Evergreen Consulting ("Evergreen") served as the overall implementer of CCLI on behalf of NEEA, providing training and support to the trade allies and partnering utility staff who participated in the program and completed comprehensive projects.

A "comprehensive" approach to commercial lighting retrofits typically includes the following components.

1. The project must address all of the lighting retrofit opportunities in the proposed project space.
2. The comprehensive approach encourages the trade ally and the owner to assess the project based on overall light level and light quality standards, such as those recommended by the Illuminating Engineering Society (IES), rather than on one-for-one technology replacements
3. To encourage the above, the incentives are based on a percentage of overall lighting power density (LPD) reductions. In some cases, these incentives took a tiered approach where lower LPD levels beyond code were awarded higher incentives.

4. A comprehensive lighting retrofit may include removing or relocating light fixtures instead of, or in addition to, upgrading or replacing existing fixtures. But the point again is to meet overall light level and quality standards.

Evergreen conducted initial trainings to introduce the concept of comprehensive lighting retrofits to a select group of high-performing trade allies invited from each participating utility territory. Following the initial trainings, Evergreen staff served as “lighting specialists,” assisting the participating trade allies in developing and delivering comprehensive retrofit solutions for each project.

2. METHODOLOGY

This study involved three main tasks:

1. Review of Utility Lighting Programs, which included:
 - a. Review of Lighting Program Offerings – review online documentation describing the lighting retrofit program offerings of the various utilities in the Northwest region
 - b. Utility Program Manager Online Survey – work in coordination with NEEA and MSI to develop an online survey instrument for utility program managers in the region, and analyze the results
2. Lighting Project Review – review a sample of typical lighting retrofit projects to determine standard retrofit practices
3. Trade Ally Online Survey – work in coordination with NEEA and MSI to develop an online survey instrument for trade allies in the region, and analyze the results

The subsections below describe the methodology for each of these tasks.

2.1 Review of Lighting Program Offerings

The first task in the study required HMG to review the lighting retrofit incentive programs currently offered by utilities in the Northwest region. HMG researched thirty of the major utility lighting incentive programs in the region as identified by NEEA, and identified their current offerings based on available online documentation for each program (Appendix A: Utility Lighting Program Offerings, includes a full list of the programs HMG reviewed).

Section 3.1 presents these findings.

HMG used these findings to aid in development of the survey instrument used in the utility program manager survey discussed below.

2.2 Utility Program Manager Survey

In addition to reviewing current utility program offerings, the HMG team surveyed utility program managers in the Northwest region, asking about current program practices and future plans.

The goals of the utility manager survey were as follows:

- ◆ Identify lighting retrofit program offerings from the Northwest utilities
- ◆ Identify barriers to establishing comprehensive commercial lighting programs for utility customers
- ◆ Identify the impact of the forthcoming federal standards for linear fluorescent lamps and Energy Policy Act (EPACT) legislation on utility programs and plans for the future.

MSI, a market research consultancy, took primary responsibility for the utility program manager survey. NEEA and HMG coordinated with MSI to develop the survey questions in response to the goals described above, with MSI crafting the final survey instrument and administering the online survey.

Appendix B shows the final utility program manager survey instrument.

Following a preliminary email from NEEA's initiative manager notifying the respondents of the coming survey, MSI sent email invitations to seventy-nine utility lighting program managers in the Northwest who are involved in the utilities' commercial lighting retrofit programs. MSI fielded the utility program manager survey from April 4 to April 25, 2012, with a target of forty-six completed surveys. Over the course of the survey fielding, MSI sent up to four reminder emails to those who had not yet completed the survey.

Of the seventy-nine invitees, forty individuals from thirty-eight different organizations completed the self-administered survey. The full survey took an average of thirty minutes to complete.

Section 3.2 presents the outcomes of the utility program manager survey.

2.3 Lighting Project Review

In order to assess the nature of typical lighting retrofit projects in the Northwest region, HMG conducted a detailed review of a sample of lighting retrofit projects completed between 2010 and 2012.

HMG initially set out to conduct a review of at least thirty projects from across the Northwest region. However, the scope of this study limited the review to project information that was readily available in accessible databases. As a result, the project review sample was limited to retrofit projects completed in either Energy Trust of Oregon or Idaho Power territories.

HMG coordinated with Energy Trust of Oregon and Idaho Power, in consultation with NEEA, to gain access to project files for a sample of lighting projects from each utility.

Energy Trust of Oregon (ETO) provided a database of completed projects from 2010 to mid-2012. HMG selected projects from the ETO database for review based on the following parameters:

- ◆ The sample included a quantity of projects from each calendar year approximately proportional to the total number of projects completed in each year
- ◆ The sample was approximately proportional to the total number of "commercial" and "industrial" projects completed during the sample time frame
- ◆ The sample included a range of project sizes in terms of kWh savings

HMG randomly selected the sample projects within these parameters. Once HMG had selected the sample projects, Energy Trust of Oregon sent lighting calculator files for each selected

project. HMG oversampled in case of any problems with any of the project files, selecting a total of thirty projects. Information was not available for two of the selected projects, so the final number of projects was twenty-eight. NEEA does not distinguish between commercial and industrial in the same way as Energy Trust of Oregon, so this study treats all of the Energy Trust of Oregon projects as “commercial.”

Idaho Power did not provide HMG with a database of projects to select a sample from. Rather, HMG described the desired parameters, and utility staff sent HMG a randomly selected group of project files for review. Again, HMG oversampled in case of problems with any of the project files, selecting a total of twenty-five projects.

In all HMG reviewed a total of fifty-three lighting projects. Based on the limited geographic scope of the sample and the relatively small sample size, NEEA and HMG consider this to be an exploratory study and do not consider the results statistically representative of the region. However, Energy Trust of Oregon and Idaho Power were also the two largest participants in the CCLI pilot, so the results of this project review may provide a useful comparison to the results of the comprehensive projects completed under the CCLI pilot programs.

Section 4 presents the results of the lighting project review.

2.4 Trade Ally Survey

This study also included a survey of the trade allies who perform lighting retrofit projects in the Northwest region.

The goals of the trade ally survey were as follows:

- ◆ Provide an overview of the standard practices of trade allies involved in lighting retrofit projects in the Northwest region, prior to a possible widespread implementation of comprehensive lighting retrofit programs
- ◆ Identify barriers to comprehensive lighting solutions as well as issues that might not be apparent from a review of lighting retrofit projects, such as training and market expectations
- ◆ Identify trade ally expectations regarding the T12 lamp and ballast phase-out resulting from federal regulations

Again, MSI took primary responsibility for the trade ally survey. NEEA and HMG coordinated with MSI to develop the survey questions in response to the goals described above, with MSI crafting the final survey instrument and administering the online survey.

Appendix C contains the final trade ally survey instrument.

Following a preliminary email from NEEA’s initiative manager notifying the respondents of the coming survey, MSI sent email invitations to 1,037 trade allies in the Northwest who are involved in lighting retrofit projects and submit those projects to the utilities’ commercial lighting retrofit programs. MSI fielded the trade ally survey from July 16 to August 16, 2012, with a target of eighty to one hundred completed surveys. Over the course of the survey fielding,

MSI sent up to four reminder emails to those who had not yet completed the survey. To encourage participation in the survey, MSI entered participants into a prize drawing for either an iPad, a \$500 check, or a \$500 contribution to a charity.

Of the 1,037 invitees, seventy-six individuals from thirty-eight different organizations completed the self-administered survey. The full survey took an average of thirty minutes to complete.

Section 5 presents the results of the trade ally surveys.

3. FINDINGS OF THE REVIEW OF CURRENT UTILITY PROGRAMS

3.1 Review of Current Utility Lighting Programs

During the development of the Utility Program Manager survey tool, HMG reviewed the offerings of lighting programs available in the Northwest region. This review helped to inform the development of the survey tool. The information collected in this activity was limited to what was available from the websites of each program. As such, this review may not include all relevant details for each program. The findings presented in the subsections below represent HMG's recommendations for the survey tool following this review.

HMG reviewed thirty different lighting programs available across the Northwest region. They had the following characteristics:

- ◆ Twenty-six programs support lighting retrofits
 - Three of those twenty-six also support new construction efficiency measures
- ◆ Seven programs support new construction efficiency efforts
 - Three of those seven also support lighting retrofits in existing buildings
- ◆ Twenty-three of the twenty-six retrofit programs include some form of measure-specific incentives or prescriptive measures
- ◆ Eight of the twenty-six retrofit programs offer a “custom” option
- ◆ Two of the twenty-six retrofit programs offer incentives based on energy savings
 - Both of these programs describe themselves as “comprehensive,” although this use may differ from the CCLI definition of “comprehensive.”

Appendix A contains a list of reviewed programs.

Following this review of available programs, HMG provided recommendations to help shape the utility program manager survey tool. Summarized below are HMG's recommendations for revisions to the utility program manager survey, based on the findings of the program review.

Design Review

At least two programs either offer or require customers to have their proposed designs reviewed by a third party. The Idaho Power Building Efficiency program requires design review of photocontrol systems by the Integrated Design Lab, while the Pacific Power Energy FinAnswer program offers design review to customers who want it.

As comprehensive strategies encourage lighting contractors to assess the light levels and light quality of the projects, design review or customer consultation is likely to be an increasingly important element of program design. This will be a needed element of these programs as projects try to achieve deeper savings, so HMG recommended that the utility manager survey should capture this.

Application Process

At least four programs either recommend or require customers to apply for incentives through a contractor on an approved list, such as the “Northwest Trade Ally Network” sponsored by Bonneville Power Administration (BPA). Because comprehensive programs are more complicated, HMG expects that the use of approved contractors will increase in the future, and that the training requirements for those contractors may also increase.

3.2 Utility Program Manager Survey

As described in section 2.2, forty individuals from thirty-eight organizations completed the online utility program manager survey. General characteristics of these respondents break down as follows:

- ◆ Twenty-three of the forty respondents (58%) work for a public utility customer of BPA
 - Of those twenty-three, ten reported making modifications to BPA’s standard program offering in order to meet their own program needs
- ◆ Six of the forty respondents (15%) work for CCLI pilot participant utilities

The following sections outline the survey responses of these utility program managers.

Appendix D contains a memo from MSI summarizing the results of the utility program manager survey.

Current Lighting Retrofit Programs

The survey first asked respondents about their current standard lighting retrofit programs, including incentives and project requirements. Of the forty respondents, almost all reported offering fixed financial incentives based on equipment installed, while fewer than a third reported any kind of alternative incentive methods, as shown in Table 1.

Table 1: Types of Incentives Offered

Question: Which types of standard lighting retrofit program incentives do you currently offer to commercial customers? (n=40)		
	n	Percent
Fixed financial incentives based on equipment installed or new control devices	36	90%
Per kWh incentives from estimated reductions in lighting energy use (i.e. installed power multiplied by hours of use)	12	30%
Incentives specifically for lighting design work	1	3%

Notes: Survey results provided by MSI. Results add to more than 100% because the survey asked respondents to select all responses that applied.

Out of the thirty-six who reported offering fixed financial incentives, thirty-four were able to provide more details of their incentives, and two did not know. Those thirty-four reported that their programs are structured to offer higher incentive rates for a variety of technologies or strategies, as shown in Table 2.

Table 2: Programs With Incentives That Pay More for Certain Measures

Question: For programs using fixed incentives based on equipment installed, are incentives structured to pay more for any of the following. (n=34)		
	n	Percent
Installation of lighting controls	29	85%
Installation of low wattage lamps or low ballast factor ballasts	23	68%
A reduction in the number of lamps when upgrading multi-lamp fixtures	22	65%
A reduction in the number of lamps by delamping currently installed fixtures	15	44%
A reduction in the number of fixtures when upgrading multiple fixtures	10	29%
Other	4	12%

Notes: Survey results provided by MSI. Results add to more than 100% because the survey asked respondents to select all responses that applied.

Respondents reported that their programs included certain performance requirements, as shown in Table 3.

Table 3: Program Performance Requirements

Question: What performance requirements are placed on projects within your standard lighting retrofit programs? (n=40)		
	n	Percent
Project must achieve certain minimum savings versus baseline	26	65%
Project must meet or exceed local energy code	13	33%
Project must meet IES illuminance requirements or other light level requirements	5	13%
Project must include certain basic controls	4	10%
Projects must address all opportunities of certain types (e.g., exit signs, T-12s, etc. must be addressed if present)	4	10%
Other	10	25%

Notes: Survey results provided by MSI. Results add to more than 100% because the survey asked respondents to select all responses that applied.

Seven of thirty-eight respondents (18%, excluding two who did not know) reported that their standard programs offer escalating or tiered incentives designed to promote deeper savings.

Although nearly all respondents (thirty-nine of forty, 98%) reported that their programs offer incentives for lighting controls, the details of those control incentives vary among programs:

- ◆ Twenty-three of thirty-six (64%, excluding three who did not know) reported that all incentives were the same regardless of the control type
- ◆ Thirteen of thirty-six (36%, excluding three who did not know) reported that the incentives varied depending on the controls

Almost all programs offered incentives for occupancy sensors and photocontrols; programs incentivized other control types less consistently, as shown in Table 4.

Table 4: Lighting Control Types Incentivized by Respondents' Standard Programs

Question: For each type of lighting controls listed below, please indicate if it is eligible for incentives as part of your standard lighting retrofit programs. (n=39)			
	Eligible	Not eligible	Don't know
Occupancy sensors	38	0	1
Photocontrols	34	2	3
Astronomical time clocks	25	2	12
Centralized ("tuned") dimming controls	22	5	12
Time sweep controls	16	4	19
Addressable controls	15	8	16
Egress lighting shut-off controls	15	7	17
Manual dimming controls	7	19	13
Demand response controls	5	18	16

Notes: responses from the thirty-nine respondents who reported that their programs offer incentives for lighting controls. Survey results provided by MSI

Most of the survey respondents (thirty-three of thirty-eight, 87%, excluding two who did not know) reported that their utilities offer custom lighting retrofit programs. Table 5 shows the characteristics of these custom programs breakdown.

Table 5: Custom Program Characteristics

Question: Which types of custom incentives do you currently offer to commercial customers? (n=33)		
	n	Percent
Per kWh incentives calculated from lighting energy use reductions (i.e., installed power multiplied by hours of use)	24	73%
Fixed financial incentives based on equipment installed change-outs	10	30%
Per kW incentives calculated from lighting power reductions	3	9%
Incentives specifically for lighting design work	2	6%
Other	7	21%

Notes: Responses from the thirty-three respondents who reported offering custom programs. Survey results provided by MSI. Results add to more than 100% because the survey asked respondents to select all responses that applied.

Performance requirements for custom lighting retrofit programs tended to be less rigorous than those for standard program offerings. Table 6 shows the breakdown of performance requirements for respondents' custom programs.

Table 6: Performance Requirements for Custom Programs

Question: What performance requirements are placed on projects with custom incentives? (n=30)		
	n	Percent
Project must achieve certain minimum savings versus baseline	15	50%
Project must meet or exceed local energy code	9	30%
Projects must address all opportunities of certain types (e.g., exit signs, T-12s, etc. must be addressed if present)	3	10%
Project must meet IES illuminance requirements or other light level requirements	2	7%
Project must include certain basic controls	2	7%
Other	8	27%

Notes: Responses from the thirty respondents who were able to report on performance requirements for custom programs. Survey results provided by MSI. Results add to more than 100% because the survey asked respondents to select all responses that applied.

Only three of thirty-two respondents (9%, excluding one who did not know) reported that their custom programs include escalating or tiered incentives designed to promote deeper savings.

Training, Technical and Marketing Support

Twenty-four of thirty-eight respondents (63%, excluding two who did not know) reported that their programs offer training or technical support to contractors for lighting upgrades and retrofits.

Respondents most often mentioned training on lighting criteria and lighting design calculations (n = 7 each), when asked about the type of training offered to trade allies and electrical contractors. (Table 7)

Table 7, Table 8 and Table 9, below, outline the types of training and technical support that respondents reported offering. Table 7 also outlines the types of training that programs offer on lighting design and illuminance calculations. Table 8 shows the types of training that programs

offer on the design, installation and commissioning of lighting controls. Table 9 discusses the design assistance that programs offer.

Respondents most often mentioned training on lighting criteria and lighting design calculations (n = 7 each), when asked about the type of training offered to trade allies and electrical contractors. (Table 7)

Table 7: Types of Training Programs Offered on Lighting Design and Illuminance Calculations

Question: What types of training and/or technical services are offered to trade allies / electrical contractors regarding lighting design and illuminance calculations? (n=22)		
	n	Percent
Lighting quality criteria such as illuminance, uniformity and color rendering	7	32%
Lighting design calculations and/or software	7	32%
Lighting design templates such as the Advanced Lighting Guidelines, or the DOE's Commercial Building Initiative	0	0%
Other	8	36%

Notes: Responses from the twenty-two respondents who were able to report on training or technical services on lighting design and illuminance calculations; two did not know. Survey results provided by MSI.

As Table 8 shows, just under half of respondents report offering training on design and specification of lighting controls, but only two respondents reported offering training on installation and commissioning of controls systems.

Table 8: Types of training programs offer on design and installation of lighting control systems

Question: What types of training and/or technical services are offered to trade allies / electrical contractors regarding the design and installation of lighting control systems? (n=19)		
	n	Percent
Design and specification of controls systems	9	47%
Installation and commissioning of control systems	2	11%
Other	8	42%

Notes: Responses from the nineteen respondents who were able to report on training or technical services on design and installation of lighting controls; five did not know. Survey results provided by MSI.

As Table 9 shows, a majority of programs do not offer any design review as part of their programs. Nine respondents reported that design review is available for some or all program projects, and only three respondents reported that design review is mandatory for some or all projects.

Table 9: Program-Provided Design Review

Question: Apart from the Lighting Design Labs, does your program provide design review to contractors or customers who are taking part in the program? (n=38)		
	n	Percent
No	20	53%
No, but the program provides information about design review services	6	16%
Yes, design review is available for some projects	4	11%
Yes, design review is available for all projects	5	13%
Yes, design review is mandatory for some projects	1	3%
Yes, design review is mandatory for all projects	3	8%

Notes: Responses from the thirty-eight respondents who were able to report on design review their programs offer; two did not know. Survey results provided by MSI.

Approved Trade Ally Lists

Twelve of forty respondents (30%) reported providing marketing support to trade allies through recognitions or awards.

Although the vast majority (thirty-seven of thirty-nine, 95%, excluding one who did not know) of respondents do not require customers to use approved contractors, twelve of thirty-nine (31%) maintain lists of approved contractors as shown below in Table 10.

Table 10: Approved Trade Ally Lists

Question: Are customers required to work with a utility-approved contractor to take part in a lighting retrofit program? (n=39)		
	n	Percent
Yes, customers must work through an approved contractor	2	5%
No, but we provide a list of recommended contractors	12	31%
No, but approved contractors have access to additional incentives or services	0	0%
No, we do not provide referrals for approved or recommended contractors	25	64%

Notes: Responses from the thirty-nine respondents who were able to report on approved trade ally lists; one did not know. Survey results provided by MSI.

Future Lighting Retrofit Programs

Most respondents expect new federal regulations that effectively banned the sale of T12 lamps starting in July of 2012 to have significant impacts on the future of their lighting programs:

- ◆ Twenty-four of thirty-four respondents (71%, excluding six who did not know) report that at least 50% of their current program savings come from T12 change-outs
- ◆ Nine of twenty-four (38%, excluding sixteen who did not know) expected that their programs would lose at least 50% of their energy savings due to program and baseline changes resulting from the T12 phase-out

The majority (58%) of respondents were unsure how their program incentives would change in response to the T12 phase-out, as Table 11 illustrates.

Table 11: Program Incentive Changes After the T12 Phase-Out

Question: What changes do you plan to make to the incentives for T-12 lamps? (n=40)		
	n	Percent
Don't know	23	58%
Stop the T12 incentive entirely	5	13%
Decrease the T12 incentive to a much lower level	12	30%

Notes: Responses from all forty respondents. Survey results provided by MSI.

Similarly, less than half of respondents had specific plans about how their programs would calculate savings from T12 retrofits following the implementation of the new federal rules, as Table 12 shows.

Table 12: Program Savings Changes After the T12 Phase-Out

Question: How do you plan to count T-12 savings after the new Federal rules go into effect? (n=40)		
	n	Percent
Don't know	10	25%
Stop counting T-12 retrofit savings	1	3%
Count T-12 retrofit savings at a lower (discounted) level	8	20%
Continue counting T-12 retrofit savings in the same way you do now	8	20%
Other	13	33%

Notes: Responses from all forty respondents. Survey results provided by MSI.

Other than their plans for the T12 phase-out, only ten respondents indicated that their utility had any specific plans for developing future commercial lighting retrofit programs, and shown in Table 13. In other words, twenty respondents (or 50% of the sample) indicated that their utility has no specific plans for future program development.

Table 13: Future Program Development Plans

Question: Beyond plans made in response to the T-12 phase-out, does your utility have any other specific plans for future development of its commercial lighting programs? (n=40)		
	n	Percent
Don't know	10	25%
Yes	10	25%
No	20	50%

Notes: Responses from all forty respondents. Survey results provided by MSI.

Barriers to Implementation of Future Lighting Programs

The survey asked respondents about the importance of addressing various barriers to the implementation of future retrofit lighting programs. Table 14 summarizes the responses to various barriers presented in the survey. The table shows the percentage of respondents who answered “extremely important” or “very important” for each barrier listed in the survey, sorted from most important to least important. The table shows the total percentage for these two responses highlighted in gray.

These responses suggest that the utility program managers believe that the key challenges for future lighting programs are trade ally skill and expertise, as well as customer willingness to pursue deeper savings projects, due to additional cost, lack of awareness of benefits, and longer payback periods.

Table 14: Importance of Addressing Various Barriers to Future Lighting Programs

Question: For each potential barrier below that trade allies and your commercial customers may need to overcome in order to implement future lighting retrofits, please indicate how important it will be to address that barrier over the next few years. (n=40)

Barrier	Extremely Important	Very Important	Total: Extremely or Very Important	Don't know
Lack of trade ally skills required to propose, sell, and deliver a well-designed retrofit project	33%	35%	68%	8%
Additional up-front cost to the customer of the project, thus hard to sell	20%	48%	68%	8%
Lack of trade ally expertise in fine-tuning lighting controls to optimize savings	23%	40%	63%	8%
Lack of customer awareness of the added benefits of high quality, best practice lighting design (e.g. worker retention, productivity improvement)	15%	45%	60%	8%
Lack of customer motivation to pursue deeper savings due to the longer payback time	20%	38%	58%	10%
The continued availability of simpler utility programs that the customer or trade ally may find easier to take part in	18%	33%	51%	8%
Additional trade ally labor required to design deeper lighting savings retrofit projects, compared with 1:1 replacement projects	15%	33%	48%	13%
Customer distrust about the performance of lighting control systems	5%	38%	43%	10%
Additional paperwork for trade allies caused by more complex projects	13%	30%	43%	8%
Additional customer labor required to design lighting retrofit projects, compared with 1:1 replacement projects	10%	30%	40%	15%
Potential project delays caused by the increased complexity of projects	13%	25%	38%	10%
Concerns about degradation of visual environment with a retrofit project that attempts deeper savings	8%	30%	38%	10%
Confusion caused by utilities offering multiple lighting incentive programs to each customer	10%	20%	30%	13%
Disruption to the customer's business activities caused by the need to replace fixtures and/or add controls	5%	23%	28%	10%
Concerns about on-going maintenance problems and costs due to equipment failure, and trade ally call backs	3%	25%	28%	15%

Notes: Survey results provided by MSI

The survey also provided an opportunity for open-ended responses about potential barriers and challenges for future lighting programs. Among the twenty-eight who gave a response to this question, respondents most often mentioned “contractor capacity and ability” (n = 11) as the barrier for future lighting programs (Table 15).

Table 15: Potential Barriers and Challenges to Future Lighting Programs

Question: What obstacles or challenges do you see in the marketplace that could hinder the successful development and implementation of new lighting programs over the next few years? (n=28)		
Response Category	n	Percent
Contractor capacity and ability	11	39%
BPA-related issues, e.g., funding or incentive cuts	7	25%
Cost, especially of new technology	6	21%
Lack of funding or incentives	4	14%
Limited availability of quality products	3	11%
Other (unique responses that did not fit into any category)	14	50%

Notes: Responses from the twenty-eight respondents who provided answers. Survey results provided by MSI. Results add to more than 100% because some answers included multiple categories.

These responses suggest that utilities may need to invest more to encourage deeper savings retrofit projects, and they may need to expand efforts to inform customers that these retrofit incentive options are available. At the same time, several of these responses indicate that future funding for incentive programs from larger entities like BPA may be in question, threatening the future of lighting retrofit projects.

Future Utility Actions to Help Increase Lighting Energy Savings in the Northwest

The survey asked respondents what actions their utilities would be willing to take in order to help increase lighting energy savings in the Northwest. Table 16 summarizes the actions that the various utilities have already taken, or would consider taking in the future (total percentages shown highlighted in gray).

The relatively low percentages of respondents who are already taking actions, or would definitely consider certain options (one-third or less for all options), as well as the relatively high proportions of respondents who do not know (at least 10% for all options), suggest a high degree of uncertainty among utility program managers regarding how they will address future energy savings needs. That said, the most popular option was providing increased incentives for

comprehensive lighting retrofit approaches that provide deeper savings. Actions that involve partnering with other regional utilities also performed relatively well.

Table 16: Likelihood Utility Will Consider Taking Various Actions

Question: For each action below, please indicate whether or not you think your utility would consider taking that action to help increase lighting energy savings in the Northwest region. (n=40)

Action	Have already done this	Would definitely consider	Total: Already doing or would definitely consider	Don't know
Provide increased incentives for lighting upgrades that take a comprehensive, redesign approach to offer deeper savings	10%	23%	33%	10%
Partner with the rest of the region's utilities in delivering comprehensive lighting training	13%	20%	33%	13%
Partner with the rest of the region's utilities in the development of comprehensive lighting marketing tools and trainings for trade allies	0%	30%	30%	18%
Offer tiered incentives based on overall kWh reductions relative to code	10%	15%	25%	18%
Partner with the rest of the region's utilities in the development of comprehensive lighting marketing tools to help educate owners on the benefits of high quality, energy efficient lighting	0%	20%	20%	13%
Assist with locating willing "first adopter" contractors and customers for comprehensive lighting solution pilots	5%	13%	18%	10%
Increase program requirements for advanced technologies to help move the market toward more comprehensive lighting projects	3%	15%	18%	13%
Increase program requirements for evidence of optimized lighting designs to help move the market toward more comprehensive lighting projects	3%	15%	18%	15%
Explore financial assistance for trainings and certifications for contractors	0%	10%	10%	10%
Participate in group "buy-downs" from manufacturers of target technology to increase adoption in the Northwest	0%	8%	8%	28%

Notes: Survey results provided by MSI

The Role of NEEA

Finally, the survey asked what actions NEEA should be taking to better assist utilities in achieving their energy savings goals. Table 17 shows the options presented in the survey, listed in order of preference.

These responses suggest that the utility managers would most like to see NEEA supporting regional training and education efforts. The most popular responses all relate to providing trainings and resources beneficial to and shared by all the utilities in the region (63%). On the other hand, actions such as directly developing programs at NEEA or providing marketing tools for “top performing” trade allies were less popular with the utility program managers (23%).

Table 17: Roles and Strategies NEEA Should Pursue

Question: Now thinking about what NEEA can do to help increase lighting energy savings in the Northwest region, please indicate which roles and strategies NEEA could undertake to best help your utility achieve its commercial lighting retrofit goals. (n=40)

Action	Percent “Yes”
Target, train, and work with regional distributors and manufacturer representatives to help deliver more comprehensive lighting retrofit projects	63%
Develop regional marketing tools to educate customers on the benefits of deeper, more comprehensive lighting retrofits	60%
Support the demonstration of new technologies	53%
Coordinate the sharing of tools and resources between utilities to help the market process more complex lighting retrofit projects	50%
Improve existing tools for lighting redesign so they are more applicable to the retrofit market rather than new construction projects	48%
Provide regional “design” services for trade allies	45%
Develop a regional “hub” of resources for trade allies and electrical contractors serving utility programs	45%
Develop a regional lighting certification program that works to improve the skill sets of trade allies and electrical contractors	43%
Develop a new program to incentivize deeper lighting retrofits	35%
Improve existing lighting calculator tools to include more accurate assessments of savings from controls	33%
Develop regional marketing tools to help “top performing” and high quality trade allies differentiate their abilities in the marketplace	23%
Don’t know	2%

Notes: Survey results provided by MSI

The survey also provided the opportunity for open-ended responses regarding actions that NEEA should be taking in the lighting retrofit market. Only sixteen respondents provided an answer, with the most frequent answers relating to training or education (n = 5) – see Table 18.

Table 18: Actions NEEA Should Take

Question: What are the most important things NEEA can do to help your utility achieve its commercial lighting retrofit goals? (n=16)		
Response Category	n	Percent
Training and education	5	31%
Product buy-down or upstream incentives	3	19%
Program improvements	3	19%
Product and technology support	3	19%
General regional coordination	2	13%
None	1	6%

Notes: Responses from the sixteen respondents who provided answers. Readers should interpret these results with caution due to the small sample size. Survey results provided by MSI.

The utility program managers generally see NEEA coordinating regional efforts at a high level, such as training and resource development or product “buy-down” programs, while leaving the specific program details to the respective utilities throughout the Northwest region.

Conclusions

Survey responses indicate that commercial lighting retrofit programs offer relatively straightforward incentive structures that are simple for the utilities to implement and calculate. Ninety percent of respondents report offering fixed financial incentives for lighting equipment and controls installations. Incentives based on estimated annual energy savings (“per kWh”) are much more common in custom programs (73%) than in standard program offerings (30%). Despite the varying savings provided by different control strategies in different space types, most standard and custom programs provide the same fixed-incentive amount for all types of lighting controls installed.

Training and marketing support are key concerns for utility program managers as lighting programs are likely to become more complex. Most utilities (63%) do offer some kind of training for electrical contractors, and 32% offer design review. Only about three in ten provide marketing support for trade allies, or lists of approved contractors for their customers. Only two of thirty-nine respondents reported that their programs require customers to use approved contractors.

Survey responses suggest that utilities may be somewhat unprepared to transition to more complex program models following the T12 phase-out. A majority of utilities (71%) report that at least half of their energy savings comes from T12 change-outs, but most utilities (58%) had no specific plans for adjusting their programs to adjust to the T12 phase-out. In addition, three-quarters of respondents were not aware of any specific plans for the future development of lighting programs.

Utility managers reported that a lack of trade ally expertise and increased project costs to the customer constituted the major barriers in the implementation of more complex or comprehensive lighting programs. Despite the need for and importance of training, only about half of the survey respondents reported that they either currently offer or would probably offer training on lighting retrofits. However, they most commonly (31%) cited regional coordination of training efforts among a number of roles and strategies NEEA should pursue in support of commercial lighting retrofit programs.

While the survey findings suggested some willingness on the part of utility program managers to transition to more comprehensive lighting retrofit programs, uncertainty remains regarding how the utilities will implement these programs, and how their customers and trade allies will adjust to the greater complexity of these programs.

4. LIGHTING PROJECT REVIEW

As discussed in section 2.3, HMG reviewed a total of fifty-three typical lighting retrofit projects from the Energy Trust of Oregon and Idaho Power territories. The fifty-three projects break down as follows:

- ◆ Twenty-five projects from Idaho Power territory
- ◆ Twenty-eight projects from Energy Trust of Oregon, comprising seventeen from Portland General Electric, and eleven from Pacific Power and Light
- ◆ Fifty projects in areas classified as urban; three projects in areas classified as rural

Although the total sample was relatively small, there were several building types that were more common than others. Retail, manufacturing, warehouse, and office building types were the most common in the sample. Table 19 shows the breakdown of building types included in the sample.

Table 19: Building Types (n=53)

Building Types	n	Percent
Retail	10	19%
Manufacturing	10	19%
Warehouse	9	17%
Office	8	15%
Education	4	8%
Grocery	2	4%
Food Processing	2	4%
Other (single building type examples, or categorized as “other” by the program)	8	15%

Notes:

4.1 General Project Review Findings

The following tables outline the general findings from the project review. Each table shows results for all projects in the sample, as well as results for each of the four most common building types (retail, manufacturing, warehouse, and office). Other building types were not included due to their small quantities.

Table 20 shows the average energy savings for all fifty-three projects in the sample, as well as for the most common building types. As the table shows, manufacturing projects resulted in substantially more total energy savings than other building types.

Table 20: Average Energy Savings

Building Types	Average Energy Savings (kWh/year)
All Projects	87,314
Retail	75,373
Manufacturing	218,650
Warehouse	53,709
Office	53,608

Table 21 shows the average percent energy savings compared to pre-retrofit energy use. In this case, warehouse and office projects saved the most energy when compared to pre-retrofit conditions.

Table 21: Average Percent Energy Savings Compared to Pre-Retrofit

Building Types	Average Energy Savings (%)
All Projects	56%
Retail	50%
Manufacturing	55%
Warehouse	62%
Office	64%

Table 22 shows the average lighting power density (LPD), in Watts per square foot (W/sf), following the retrofit. For comparison, the table also shows the ANSI/ASHRAE/IESNA 90.1-2010 (ASHRAE) model code LPD values for each building type. Although the LPDs for most of the building types are well below ASHRAE limits, the average LPD for completed office retrofits of 1.24 W/sf is substantially higher than the ASHRAE limit of 0.90 W/sf. However, these comparisons should be used with caution, as the sample sizes for each building type are relatively small, and may not be representative of all retrofit projects for that building type.

Table 22: Average Post-Retrofit Lighting Power Density (LPD)

Building Types	Average LPD (W/sf)	ASHRAE 90.1-2010 LPD (W/sf)
All Projects	0.81	N/A
Retail	0.71	1.40
Manufacturing	0.63	1.11
Warehouse	0.42	0.66
Office	1.24	0.90

Notes: ASHRAE LPD shown represents the “Building Area Method” used for calculating whole building LPDs

Table 23 shows the average incentive rate for the full sample, as well as the individual building types. As the table illustrates, incentive rates tend to be highest for manufacturing building retrofit projects, and relatively low for office retrofits.

Table 23: Average Incentive Rate

Building Types	Average Incentive Rate (\$/kWh)
All Projects	\$0.141
Retail	\$0.149
Manufacturing	\$0.157
Warehouse	\$0.145
Office	\$0.123

These incentive rates appear to be relatively consistent with the average payback periods, as illustrated in Table 24. Office projects have the fastest payback periods, while retail and manufacturing retrofits tend to have longer payback periods.

Table 24: Average Payback Period

Building Types	Average Payback Period (years)
All Projects	3.4
Retail	3.7
Manufacturing	3.6
Warehouse	2.7
Office	1.6

Again, due to the small sample size, these results may not be entirely representative of lighting retrofit projects in the Northwest region. It is also necessary to consider all of these results together, rather than independently. For example, although office projects appear to have the highest percentage of savings, with the lowest incentive rates, and the fastest payback, there still may have been some missed energy savings opportunities, as indicated by the relatively high post-retrofit LPD.

4.2 Retrofit Project Characteristics

The tables below outline specific project measures and characteristics from the sample. Table 25 outlines the frequency of different measure types for the full sample. As the table shows T12 and High-Intensity Discharge (HID) (high-pressure sodium or metal halide) change-outs were the most common measures. Slightly less than half (45%) of the projects used lighting controls. A large majority (68%) of projects also included some form of custom measure.

Table 25: Retrofit Project Characteristics (n=53)

Project Measure	n	Percent
Lighting controls	24	45%
T12 change-outs	46	87%
T8 change-outs	3	6%
HID change-outs	27	51%
Incandescent general lighting change-outs	20	38%
Incandescent exit sign change-outs	10	19%
Custom measures	36	68%

Notes: Results add to more than 100% because some projects employed more than one measure type.

Table 26 shows a breakdown of lighting controls use by building type. The majority of warehouse and manufacturing projects (89% and 70% respectively) used lighting controls, but only a few retail and office projects (30% and 25% respectively) included controls.

Table 26: Use of Lighting Controls by Building Type

Building Type	n	Percent
All Projects (n=53)	24	45%
Retail (n=10)	3	30%
Manufacturing (n=10)	7	70%
Warehouse (n=9)	8	89%
Office (n=8)	2	25%

Notes:

The nineteen projects with custom measures all came from the Energy Trust of Oregon sample (68% of the total Energy Trust of Oregon sample, n=28). Table 27 outlines the different custom measures in these projects. A majority (58%) of the projects had an HID change-out. The Energy Trust of Oregon sample listed all HID change-outs as custom measures. The next most common custom measure (42%) was T12HO to T8 change-outs. In two cases, projects replaced one type of T8 fixture with another T8 fixture. Nine of these nineteen projects (47%) used only custom measures.

Table 27: Custom Measures in Energy Trust of Oregon Projects (n=19)

Project Measure	n	Percent
HID change-outs	11	58%
T12HO to T8 change-outs	8	42%
T12 to T5HO change-outs	2	11%
T8 to T8 change-outs	2	11%
T8 to LED change-outs	1	5%
Incandescent to LED change-outs	1	5%
Incandescent to linear fluorescent change-outs	1	5%

Notes: Results add to more than 100% because some projects employed more than one measure type.

4.3 Conclusions

Typical lighting retrofit projects generate substantial energy savings for their customers with relatively short payback periods. However, this review suggests that current lighting retrofit practices might not be addressing all energy savings opportunities.

The vast majority of retrofit projects over the past three years (87%) included T12 change-outs. This may suggest that T12s are still widely used in existing buildings, contrary to popular belief in the energy efficiency and lighting industries. On the other hand, this could also mean that trade allies have effectively sold T12 change-outs to their customers in recent years in anticipation of the upcoming T12 phase-out.

A substantial number of projects (51%) replaced HID lighting. This is likely due to the large amount of energy savings achieved by replacing older-generation HID lighting with newer fluorescent or LED technologies.

A few projects (6%) replaced older-generation T8 lighting, but only in conjunction with other lighting retrofits such as T12 change-outs. Many trade allies are likely not as aware of the

savings available from newer T8 technology, and the available savings are small relative to T12 and HID retrofits.

The use of lighting controls in the reviewed retrofit projects (45%) is not as widespread as it could be. Future lighting retrofit programs will become increasingly reliant on lighting controls, and this review of typical lighting retrofit projects suggests that trade allies may not be familiar with lighting controls, or that they are not installing lighting controls as part of their lighting retrofit projects.

The fact that a majority of projects (68%) included custom measures initially appears encouraging. However, a closer inspection of those custom measures reveals relatively typical lighting retrofit practices, such as incandescent, HID or T12 replacements. All the custom measures listed in the Idaho Power projects consisted of incandescent to CFL replacements in screw-based sockets. In addition, the Energy Trust of Oregon projects reviewed by HMG listed all HID replacements as custom measures. Of the thirty-six projects that included custom measures, only three (8%) involved something other than HID, T12 or incandescent replacements, and two of those three projects also involved other standard measures. This suggests that trade allies may only rarely propose measures beyond common lighting retrofit options.

Whether any of these projects would have qualified as “comprehensive” lighting retrofits under the CCLI pilot programs is unclear. One of the main requirements of the CCLI pilot is to address all lighting opportunities in the proposed space. While some of these projects may have met that criterion, the project information available does not specify whether or not any of these projects left any lighting unchanged. Furthermore, due to the structure of the existing lighting programs, it is unlikely that any of these projects involved a redesign of the lighting or removal of unnecessary fixtures. Again, it is impossible to know if any of the projects involved these activities. Since no incentive exists for these activities under traditional programs, the project documentation does not record them.

The relatively small sample size and the selection of all reviewed projects from only two utility sources (Energy Trust of Oregon and Idaho Power) renders it unlikely that these results are representative of lighting retrofit projects across the Northwest region. However, because Energy Trust of Oregon and Idaho Power were the two largest participants in the CCLI pilot, these findings may provide an appropriate comparison to the comprehensive retrofit projects completed under the pilot.

5. TRADE ALLY SURVEY

As described in section 2.4, seventy-six individuals from thirty-eight organizations completed the online trade ally survey. Of those seventy-six, six (8%) were participants in NEEA’s CCLI pilot programs.

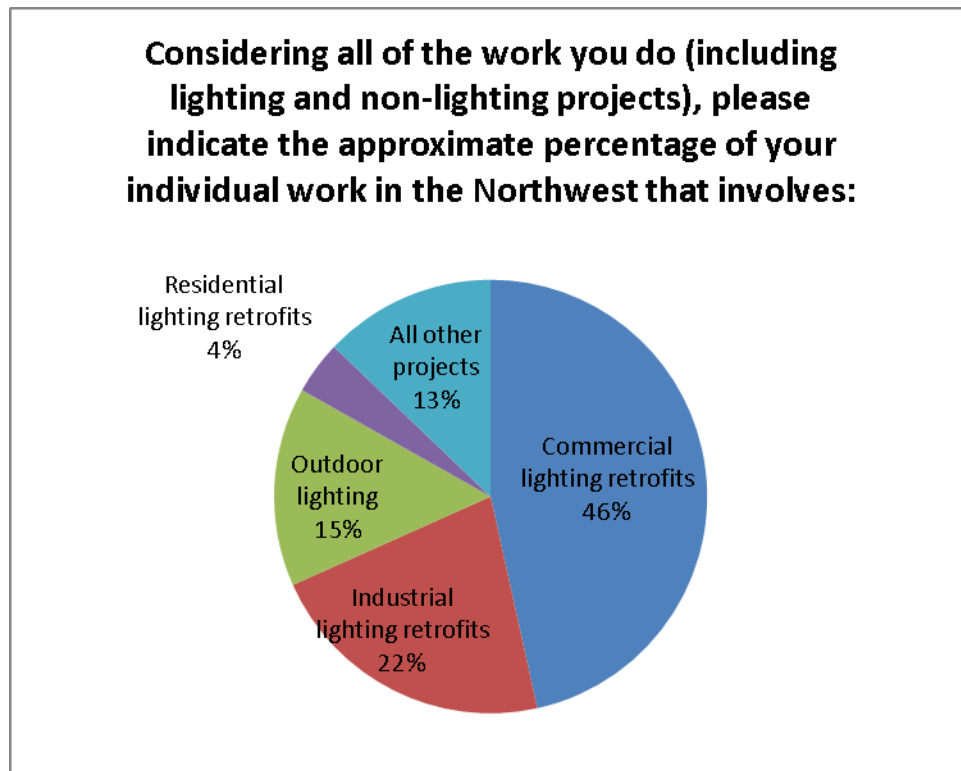
The following sections outline the survey responses of these utility program managers.

Appendix E reproduces a memo from MSI summarizing the results of the survey.

Company Services and Project Mix

Figure 1 shows the average of the trade allies’ responses regarding the types of services they provide and the types of projects on which they work.

Figure 1: Types of Trade Allies’ Projects (n=76)



Two-thirds of the responding trade allies reported that between 75% and 100% of their company’s work involves lighting retrofits or tenant improvements. On average, the respondents’ companies are completing sixty-seven commercial and industrial lighting retrofit projects in a typical year.

The survey also asked respondents what types of services their companies provide. The most common responses involved specifying and installing lighting equipment (75%), as well as

lighting design services (67%). Table 28 outlines all of the activities that Trade Allies reported engaging in.

Table 28: Trade Ally Activities

Question: Which of these activities does your company engage in? (n=76)		
	n	Percent
Specify or advise on the design and layout of lighting equipment	57	75%
Provide lighting design services	51	67%
Install commercial or industrial lighting equipment	44	58%
Sell lighting equipment wholesale	35	46%
Provide lighting maintenance services	33	43%
Sell lighting equipment retail	32	42%
General electrical contracting	30	40%
Represent lighting equipment manufacturers	20	26%
Manufacture lighting equipment	7	9%
Other	6	8%

Notes: Survey results provided by MSI. Results add to more than 100% because respondents selected all answers that applied.

Commercial and Industrial Lighting Retrofit Practices

Based on respondents' feedback on the characteristics of their lighting retrofit projects in the past year, the majority of trade allies reported including the following aspects in at least half of their commercial and industrial lighting retrofit projects:

- ◆ Specification of light fixtures, lamps, and/or ballasts (88%)
- ◆ Cost-benefit analysis (86%)
- ◆ Layout of light fixtures (65%)
- ◆ Specification of lighting control equipment (55%)

However, respondents reported including the layout of lighting controls in only about half of the projects completed in the past year.

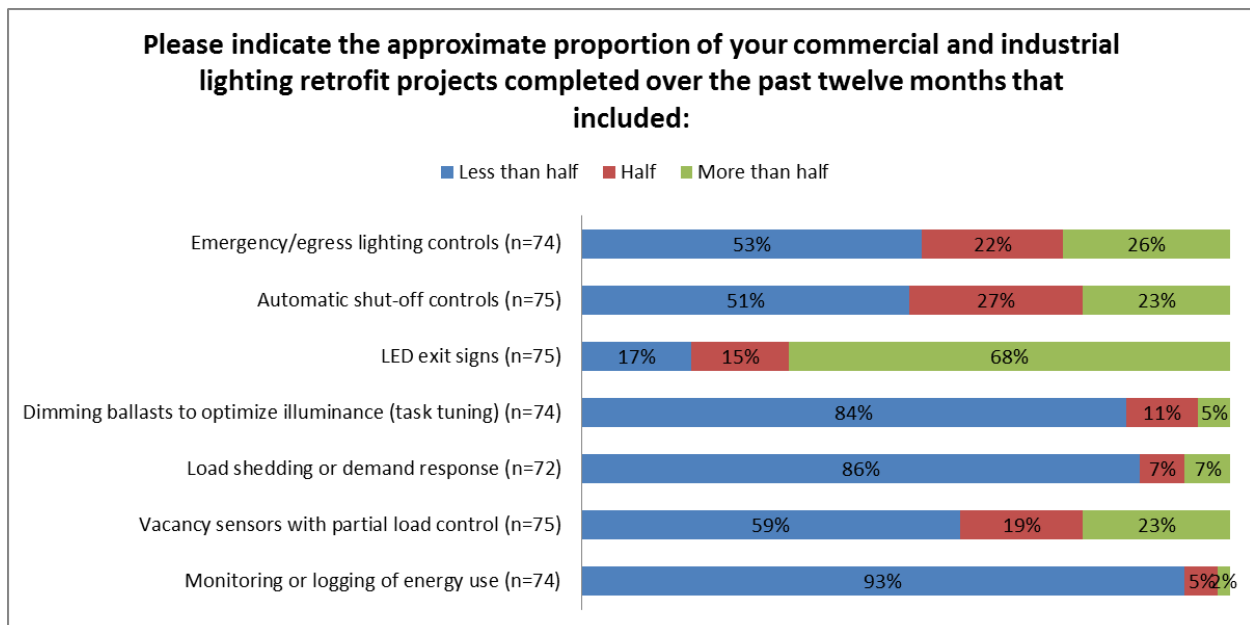
Fifty-nine of the seventy-six respondents (78%) reported that at least half of their work in the past year has been T12 change-outs.

In terms of factors that influence the retrofit measures that the trade allies select for their projects, the most common responses were previous personal experience (forty-eight of seventy-five, 64%, excluding one who did not know) and utility program requirements (forty-eight of seventy-five, 64%, excluding one who did not know). Only eighteen of seventy-four respondents (24%, excluding two who did not know) reported calculating lighting power densities (LPDs) for different options before deciding on the final measures. However, about half of the respondents (thirty-nine of seventy-six, 51%) reported calculating annual energy use savings for several options before deciding on the final retrofit measures.

Forty of seventy-four respondents (54%, excluding two who did not know) reported taking light level measurements on-site before and after the installation of new lighting equipment to ensure that the space meets adequate light levels.

As Figure 2 shows, respondents’ retrofit projects most frequently included LED exit signs among the measures listed (83% claiming that at least half of their projects included this measure). Using dimming ballasts to optimize illuminance (“task-tuning”), load shedding or demand response, and monitoring or logging energy use were the least-used measures.

Figure 2: Typical Measures Included in Respondents’ Projects



Lighting Retrofit Practices for Specific Building Types

The survey respondents reported implementing retrofit practices on a wide variety of building types in the past year. Table 29 outlines the frequency of different building types respondents reported working on.

Table 29: Retrofit Building Types

Question: Please indicate the building or location types for which you've completed lighting retrofit projects over the past 12 months. (n=76)		
	n	Percent
Warehouse	71	93%
Exterior lighting	64	84%
Office	63	83%
Industrial	58	76%
Retail	55	72%
Grocery store	40	53%
Restaurants	35	46%
Schools (K-12)	34	45%
Health services	31	41%
Institutional	30	40%
Hospital	28	37%
College/university	28	37%
Assembly	27	36%
Multifamily residential	22	29%
Lodging	21	28%
Other	6	8%

Notes: Survey results provided by MSI. Results add to more than 100% because respondents selected all answers that applied.

The optimized spacing of luminaires constituted the most popular strategy for warehouse retrofits, indicating that these trade allies do engage in some “design-based” strategies in these projects. Trade allies cited fixture integrated daylight or occupancy sensors as the second-most popular strategy. However, HMG assumes that occupancy sensors were the more common of the two control types, since so few retrofits involved skylights.

Figure 3 shows warehouse lighting retrofit strategies employed by the seventy-one respondents who completed a warehouse retrofit in the past year.

Figure 3: Warehouse Retrofit Strategies

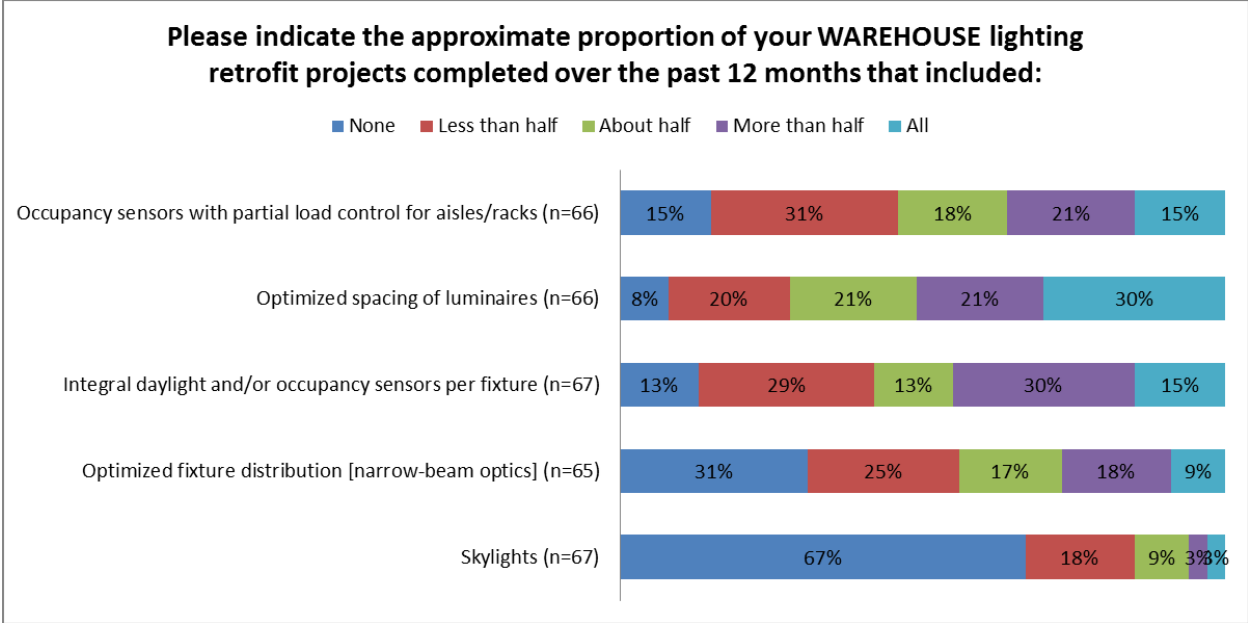


Figure 4 shows the exterior lighting retrofit strategies employed by the sixty-four trade allies who completed an exterior lighting retrofit in the past year. Respondents cited photocontrols as the most popular control strategy for exterior lighting retrofits. Fifty-four percent of respondents used timeclock controls on at least half of their projects, while only 30% used bi-level or part night controls.

Figure 4: Exterior Lighting Retrofit Strategies

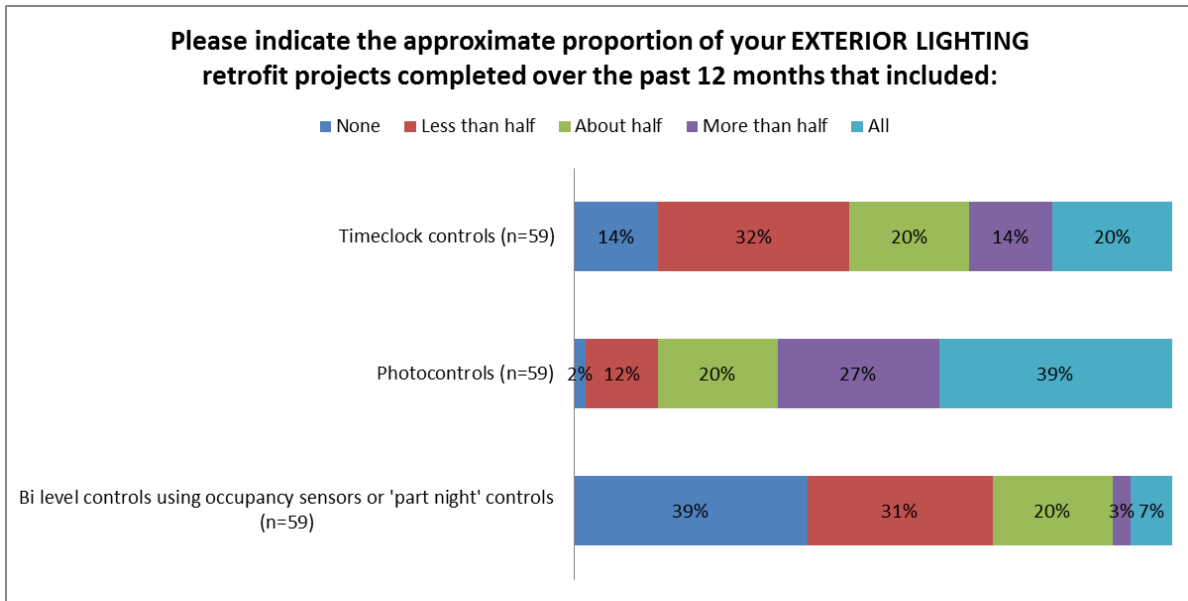


Figure 5 shows the office lighting retrofit strategies employed by the sixty-three respondents who completed an office retrofit in the past year. The two most popular measures were adjusting to an appropriate ballast factor and vacancy sensors in private offices. Fifty-six percent of respondents employed occupancy sensors with partial load control in open offices in at least half of their projects. Trade allies rarely used task ambient lighting, smart plug strips or personal control of dimming ballasts.

Figure 5: Office Retrofit Strategies

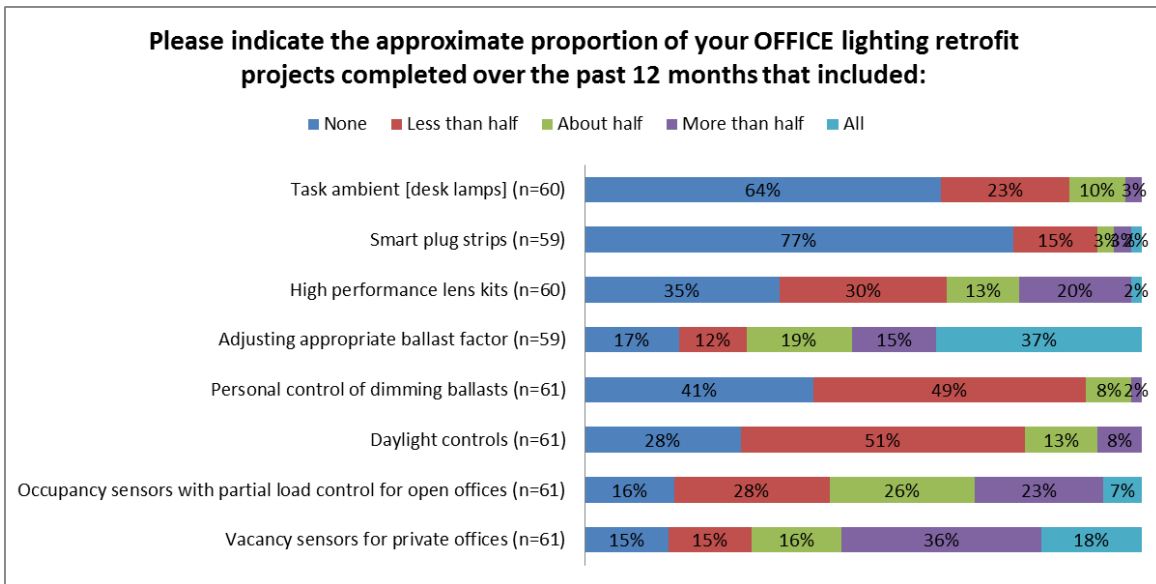
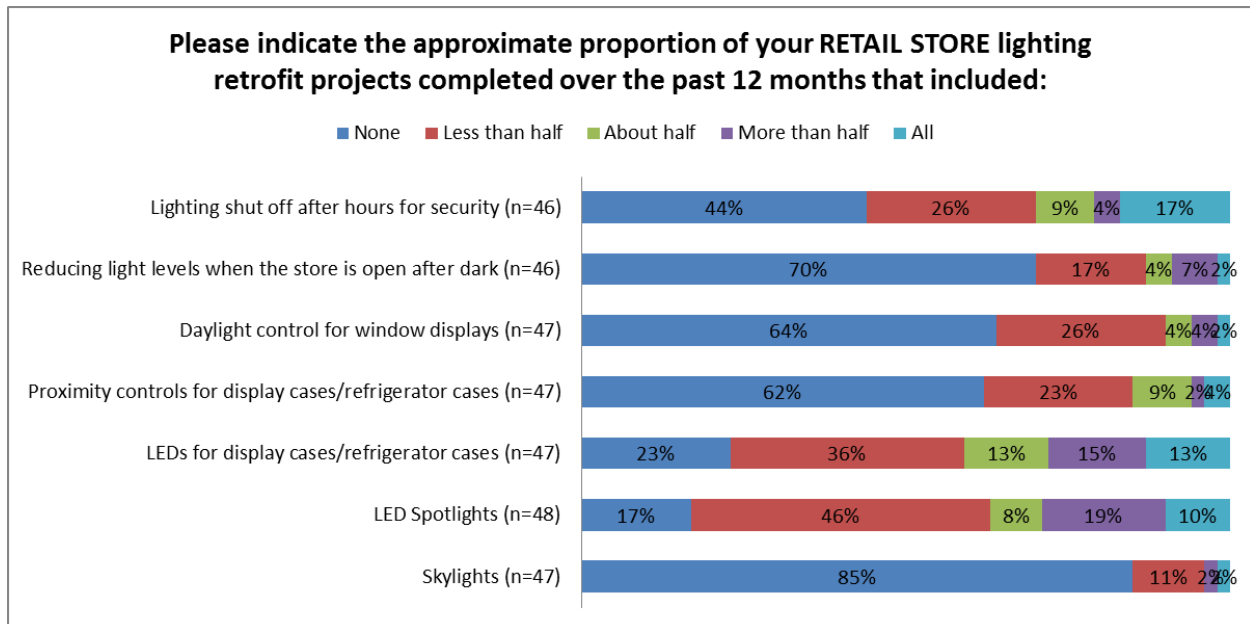


Figure 6 shows the retail store lighting retrofit strategies employed by the forty-eight respondents who completed a retail store retrofit in the past year. Trade allies used LED display case lighting and LED spotlights most often, followed by automatic lighting shut-off after hours. However, the usage of each of these retail retrofit strategies was low, and less than that observed for other space types.

When asked about building owner concerns for all space types, respondents most frequently reported concerns around “improved visual quality” and “potential equipment failure.”

Figure 6: Retail Store Retrofit Strategies



Experience with Utility Commercial and Industrial Lighting Retrofit Programs

Forty-six of seventy-six respondents (61%) reported that all of their projects in the past year involved a utility incentive program. An additional 29% of respondents reported that more than half of their projects involved incentives, and 3% reported that about half of their projects did. In total, 92% of respondents reported that about half or more of their retrofit projects involved a utility incentive program.

Thirty-four of fifty-four respondents (63%, excluding nineteen who did not know) have worked with utility incentive programs that have escalating or tiered incentives for deeper energy savings. Of those who had worked with escalating or tiered incentives, twenty-eight of thirty-four (82%) reported having a positive experience (either very positive or somewhat positive), while only two (6%) reported having a negative experience (either somewhat negative or very negative).

Thirty-five of forty-six respondents (76%, excluding twenty-seven who did not know) reported that programs with escalating incentive rates encourage their clients to pursue deeper savings on their retrofit projects. Similarly, 85% of respondents reported that financial incentives in general are a motivation for clients to pursue deeper savings. Respondents also cited reduced

maintenance costs (62%) and improved quality of the visual environment (50%) as reasons that their clients opt for deeper savings. On the other hand, forty-five of fifty-nine (76%, excluding fourteen who did not know) cited additional cost as the primary reason clients choose not to pursue deeper savings retrofits.

Thirty-five of fifty-nine respondents (59%, excluding seventeen who did not know) have worked with a utility that offers a “comprehensive” program that meets IES light level recommendations; meets or exceeds code LPD requirements; includes lighting controls; and takes all lighting in the space into consideration. Of those, twenty-nine of thirty-four (85%, excluding one who did not know) rated the utility’s program very positively or somewhat positively.

Trends and Future Developments for Lighting Retrofit Programs

Almost half (47%) of the respondents expect LED-based lighting systems to be the future of lighting retrofit projects. Sixteen percent expect that they will have more lighting retrofit business in future. Table 30 shows a categorization of responses regarding future developments in lighting retrofit programs.

Table 30: Future Changes in the Lighting Retrofit Business

Question: How do you think your lighting business is likely to change over the next three years in response to changes in lighting industry and lighting technologies? (n=76)

	n	Percent
Shift toward more LEDs	36	47%
More or improved retrofit business	12	16%
New technologies and products (other than LED)	9	12%
More lighting controls	5	7%
More exterior lighting	4	5%
Other	10	13%
Don’t know	4	5%
No answer	6	8%

Notes: Survey results provided by MSI. Results add to more than 100% because some responses included multiple categories.

Those who mentioned LEDs also noted that price, which has been a barrier, is coming down, with the expectation that the lighting market will shift toward LED over the next three years as costs come down.

Most respondents (45%, twenty-seven of sixty, excluding five who did not know) do not expect the T12 phase-out to significantly affect their business in the near future. Most of these believe that most buildings have already replaced their T12s, and those that have not will probably continue to resist changing.

Even so, most respondents (49%, thirty-three of sixty-seven) were unsure how they might modify their businesses in response to the T12 phase-out.

Education and Training

When asked how they expand their knowledge and skill sets, most respondents cited trade shows or manufacturer information as key sources of information to keep them up-to-date on the latest technologies. Table 31 outlines respondents’ sources of information for lighting technologies and design trends.

Table 31: Education and Training Sources

Question: What sources do you typically use to keep up to date on new lighting technologies and design trends? (n=75)		
	n	Percent
Trade shows (e.g. Lightfair)	52	69%
Manufacturer websites	51	68%
Updates from manufacturers	50	67%
Trade publications	43	57%
Northwest Trade Ally Network website	43	57%
Utility sponsored training	38	51%
Lighting Design Lab	37	49%
Professional organizations	36	48%
Utility websites	22	29%
Advanced lighting guidelines (ALG)/ALG online	7	9%
Other	11	15%

Notes: Responses from the seventy-five respondents who provided answers. Survey results provided by MSI. Results add to more than 100% because respondents were able to choose multiple answers.

Of the 48% of trade allies who get information from professional organizations, most (64%) attend local meetings to stay current on the latest technologies and trends. Fifty percent attend regional events. Six respondents (17%) report not attending any meetings. Table 32 outlines participation in professional organizations.

Table 32: Professional Organization Participation

Question: For these professional organizations, do you typically attend...? (n=36)		
	n	Percent
Local meetings	23	64%
Regional events	18	50%
National events	15	42%
None of these	6	17%

Notes: Responses from the thirty-six respondents who reported membership in professional organizations. Survey results provided by MSI. Results add to more than 100% because respondents were able to choose multiple answers.

For those who receive information from manufacturers, email is the most common form of communication. Table 33 outlines how trade allies typically receive updates from manufacturers.

Table 33: Communication from Manufacturers

Question: How do you typically receive updates from lighting manufacturers? (n=50)		
	n	Percent
Emails	43	86%
Training sessions	34	68%
Manufacturer website	28	56%
Newsletters	23	46%
Other	6	12%

Notes: Responses from the fifty respondents who reported receiving information from manufacturers. Survey results provided by MSI. Results add to more than 100% because respondents were able to choose multiple answers.

The survey asked the fifty-two respondents who reported attending trade shows about their membership in professional or trade organizations. Large majorities reported membership in the Northwest Trade Ally Network (89%) or the Energy Trust of Oregon Trade Ally Network (60%). Table 34 shows the professional and trade organization memberships that respondents reported.

Table 34: Professional and Trade Organization Membership

Question: What organizations do you or your company currently maintain a membership? (n=52)		
	n	Percent
Northwest Trade Ally Network	46	89%
Energy Trust of Oregon Trade Ally Network	31	60%
Other Northwest Utility's trade ally networks	3	6%
Local or national chapters of the National Electrical Contractors association (NECA)	15	29%
Local or national chapters of the National Association of Electrical Distributors (NAED)	14	27%
Northwest Energy Efficiency Council (NEEC)	13	25%
Local or national chapters of International Brotherhood of Electrical Workers (IBEW)	11	21%
Local or national chapters of Independent Electrical Contractors (IEC)	6	12%
Local or national chapter of Independent Electric Distributors (IED)	3	6%
Illuminating Engineering Society of North America "MIES" (member IES)	19	37%
Certified Energy Manager	3	6%
Other	4	8%

Notes: Responses from the fifty-two respondents who reported attending trade shows. Survey results provided by MSI. Results add to more than 100% because respondents were able to choose multiple answers.

Of the respondents who reported attending training courses, the Northwest Trade Ally Network, a local utility, or a manufacturer were the most common sources. Only four reported not taking any classes or certifications. Table 35 outlines all the responses on the source training courses.

Table 35: Training Courses

Question: Which of the following training courses have you completed? (n=75)		
	n	Percent
One or more courses run by the Northwest Trade Ally Network	51	68%
One or more courses run by your local utility	47	63%
One or more courses run by a manufacturer	46	61%
One or more courses run by Lighting Design Lab	25	33%
One or more IES courses (e.g., ED50, ED100, ED150)	16	21%
Other	10	13%
Not applicable – I haven’t taken any training courses or certifications	4	5%

Notes: Responses from the seventy-five respondents who reported on training course attendance; one did not know. Survey results provided by MSI. Results add to more than 100% because respondents were able to choose multiple answers.

In terms of specific training courses, the most popular topics were LED exit signs, and automatic shut-off controls (both 67%). Table 36 shows responses by training course topic.

Table 36: Training Course Topics

Question: Have you completed training on: (n=76)		
	Yes (n)	Percent
LED Exit Signs	51	67%
Automatic shut-off controls based on astronomical time clocks or vacancy sensors	51	67%
Vacancy sensors with partial load control for corridors and stairways	45	59%
Emergency/egress lighting controls (i.e., shut off when unoccupied)	40	53%
Dimming ballasts “tuned” to optimize illuminance level	38	50%
Load shedding / demand response	23	30%
Monitoring/logging of energy use via central control system	21	28%

Notes: Responses from all respondents. Survey results provided by MSI. Results add to more than 100% because respondents were able to choose multiple answers.

Findings

The use of advanced retrofit strategies varies by building type. While trade allies frequently employed optimized fixture placement and the use of controls in warehouse retrofits, they used advanced controls and high-efficiency lighting options less frequently in retail and office lighting retrofits.

Many trade allies (thirty-five of fifty-nine, 59%, excluding seventeen who did not know) believe they have already worked with a “comprehensive” utility program, even though only six actually participated in the CCLI pilot. Eighty-five percent said they had a positive experience with a “comprehensive” program. Most (82%) trade allies had a positive experience working with escalating incentives, and 76% say escalating incentives encourage clients to go for deeper savings. These results may suggest that trade allies and clients are prepared for widespread comprehensive programs.

Trade allies use various performance metrics to consider energy impacts of different retrofit options. Only 16% always calculate the LPDs of different retrofit options before making a final decision. However, 51% always calculate the annual energy savings of different retrofit options

before making a final decision. Fifty-four percent of trade allies measure light levels on site before and after retrofits. This may indicate that many trade allies are already considering the light quality metrics that are central to a comprehensive lighting retrofit.

Trade allies had mixed reactions to the upcoming phase-out of the T12. T12 replacements are a significant portion of trade allies' business – seventy-seven percent of trade allies report that T12 replacements make up at least half of their business – but most have no specific plans for changing their business in response to the T12 phase-out. Many trade allies believe that most businesses have already retrofitted their T12s and many do not expect the T12 phase-out to impact their businesses. Most trade allies have no specific plans for how to change their business after the T12 phase-out.

Trade shows and manufacturer communication are the most common sources of information on lighting technologies and design trends. However, almost all (seventy-one of seventy-five, 95%) also reported attending some kind of training course. Most respondents (86%) also reported maintaining membership in the Northwest Trade Ally Network, and a majority of respondents (60%) were members of the Energy Trust of Oregon Trade Ally Network. This indicates that most trade allies are well connected within the industry, and are actively seeking out information on new technologies and products.

While trade allies see LED as the future of lighting, they need more information to make the right choices to take advantage of this new technology.

6. CONCLUSIONS

6.1 Review of Current Utility Programs

6.1.1 Review of Current Utility Programs

The review of the current utility programs revealed the following characteristics:

- ◆ Twenty-three of twenty-six retrofit programs offer fixed incentives for specific measures
- ◆ Eight retrofit programs offer some form of custom incentives
- ◆ Only two offer incentives based on energy savings (kWh)

6.1.2 Utility Program Manager Survey

The results of the utility program manager survey indicate that although all utilities are aware that the lighting retrofit market is changing due to new regulations such as the T12 phase-out, and that their programs will have to change along with it, most (58%) have no specific plans for adapting their programs to these changing market conditions.

Utility program managers (68% of respondents) reported a lack of trade ally expertise as one of the key barriers to implementing more comprehensive lighting programs. Although 63% of utility managers reported offering some kind of training for electrical contractors, only about half of the respondents replied that they currently offer or probably would offer training specifically on lighting retrofit strategies. However, many utility program managers (31%) suggest that coordinating regional training efforts would be an effective role for NEEA in the lighting retrofit market.

6.2 Lighting Project Review

The lighting retrofit projects reviewed in this study consisted mainly of T12 (87%) and HID (51%) change-outs. Retrofits of older, less-efficient T8 technologies were always part of a project that also included T12 or HID replacements. Even the custom measures employed on the reviewed projects almost exclusively (93% of custom measures) consisted of T12, HID or incandescent replacements. Less than half of the reviewed projects involved any kind of controls.

The findings of the lighting project review indicate that trade allies tend to focus on the fixed-incentive, one-for-one equipment change-outs, and rarely consider project measures beyond the typical retrofit targets of T12, HID or incandescent lighting. These findings indicate that trade ally experience and skill sets under current lighting retrofit programs have not adequately prepared them for a transition to more comprehensive lighting programs in the future.

6.3 Trade Ally Survey

The trade ally survey provided additional insight into typical lighting retrofit practice in the Northwest region. The results of the survey indicated that retrofit practices and measures varied widely depending on building type. Trade allies were more likely to adjust fixture placement (72% at least half of the time) and include lighting controls (58% at least half the time) in warehouse projects. On the other hand, office and retail projects were less likely to involve

advanced controls strategies or high performance fixture options. For example, 56% of trade allies reported installing occupancy sensors in open offices at least half the time, but only 21% reported installing daylighting controls in office spaces at least half the time. Similarly, 37% of trade allies reported using LED spotlights in retail applications at least half the time, and only 30% use automatic shut-off controls after retail store hours at least half the time.

Of the trade allies who had worked with utility programs with tiered or escalating incentives, 82% had a positive experience. In addition, 76% of trade allies reported that escalating or tiered incentive structures encourage customers to pursue deeper savings in their retrofit projects.

Although only 16% of trade allies calculate lighting power densities (LPDs) for different retrofit options before making a final decision, 51% consider the annual energy savings of different options before deciding on retrofit measures. This is likely due to the fact that retrofit programs are generally more interested in overall energy savings rather than merely in LPDs. However, future programs may reference LPD limits based on new construction codes in an effort to achieve deeper savings.

The results indicate that some trade allies may be more prepared for comprehensive programs than the utility program manager surveys or project reviews suggest. These results suggest that current retrofit practices may be more closely related to trade ally business models and program incentive structures than to limitations in trade ally experience or skill sets. On the other hand, although many trade allies report that T12 change-outs are a major part of their business, most (45%) do not expect the T12 phase-out to have a significant impact on their business, nor do they have specific plans to adjust their business as a result of the T12 phase-out (49%). These results suggest that trade allies have a short-sighted view of the T12 phase-out, or they do not fully understand the implications of the T12 phase-out on lighting retrofit programs.

6.4 Overall Conclusions

Overall, current retrofit project practice and market actor (utility program manager and trade ally) feedback suggest that the lighting retrofit market in the Northwest faces several barriers to implementing more comprehensive utility lighting retrofit incentive programs that achieve deeper energy savings. These barriers fall into three main categories:

- ◆ **Utility program uncertainty**

All utility program managers are aware that their lighting retrofit programs will have to change to address new federal regulations and the loss of savings from T12 change-outs, but most utility program managers (58%) have no specific plans as to how their programs will change to meet these future challenges.

Program managers are generally willing to transition toward more comprehensive program models (33% have already or would definitely consider providing increased incentives for comprehensive lighting retrofits), but uncertainty remains regarding how the utilities will implement these programs and how their customers and trade allies will adjust to the greater complexity of these programs.

Recommendation: Utilities should actively plan for future program cycles in light of

known policy changes. Whenever possible, future plans should be communicated to trade allies and customers in advance to adequately prepare the market.

- ◆ **Trade ally experience**

The results of this study suggest that trade ally experience and skill sets vary widely. Although some trade allies may be aware of more advanced control strategies and design-based retrofit approaches, they are using them sparingly in current retrofit projects (see section 6.3, above).

Some trade allies may need more experience with new lighting technologies and controls strategies, while others may only need better training on how to sell these advanced strategies to their customers. In both cases, trade allies need more education and training to effectively deliver comprehensive lighting retrofit projects.

Recommendation: Widespread trade ally education should be a key priority for utilities and regional organization such as NEEA, in order to prepare trade allies for the more comprehensive lighting retrofits that will be required to achieve deep energy savings going forward.

- ◆ **Project costs, incentive structures and trade ally business models**

The lighting retrofit market in the Northwest appears heavily reliant on fixed incentives for prescriptive measures (one-for-one change-outs or control equipment installations). Ninety percent of survey respondents reported offering fixed incentives as part of their program portfolios. These types of programs are easy for utilities to implement and offer straightforward participation for customers and contractors. However, the results of this study suggest that trade allies may be unlikely to pursue deeper savings retrofit options, instead targeting the fixed-incentive measures that provide the best payback, and potentially missing other retrofit opportunities that standard program measures do not address.

These fixed incentives also do not always represent actual energy savings. For example, most utilities (64%) report that they offer the same fixed incentive rate for all control types in their standard programs. This creates the potential for incentivizing strategies that may not result in the most energy savings. Study results also indicate that the potential added project costs of more comprehensive lighting retrofits are a significant barrier for customers (68% of utility managers report that added cost is an very or extremely important barrier, and 76% of trade allies report that added cost is a barrier to their customers), even though those projects may provide deeper savings.

Recommendations:

- Utility incentive program structures should prioritize the deepest energy savings possible, rather than just encouraging the most straightforward retrofits. Incentives will need to encourage both the trade ally and the customer to strive for deeper savings by adequately rewarding the added effort and cost to achieve those savings. These incentive structures will necessarily be unique to each local utility territory, depending on local market forces such as utility rates and trade ally experience.

- Trade allies need to be adequately prepared to communicate the added benefits of comprehensive lighting retrofits, and the utility incentive programs and rates that support those retrofits. This will be a key feature of the trade ally education described above.

Successful implementation of more comprehensive lighting retrofit programs that achieve deeper savings will require the resolution of these barriers. Utilities will need to develop clear program goals, and strategies to achieve those goals. Trade allies will need to have the knowledge and experience to deliver comprehensive lighting retrofits. Utilities will need to carefully structure program incentives to adequately compensate for the added effort of comprehensive retrofit approaches, and to encourage trade allies and customers to go above and beyond the current fixed incentive model.

In addition to the market barriers listed above, this study also examined the role of NEEA in the energy efficient commercial lighting retrofit market:

- ♦ **Role of NEEA -**

Responses to the utility program manager survey indicated that utility managers would most like NEEA to continue to support trainings and resources beneficial to and shared by all the utilities across the Northwest region. For example, 63% of respondents suggested that NEEA should work with distributors and manufacturers representatives to encourage comprehensive retrofits, and 60% suggested that NEEA should develop marketing tools to educate customers on the advantages of comprehensive retrofits. Actions such as directly developing programs at NEEA (only 35%) or providing marketing tools for “top performing” trade allies (23%) were less popular with the utility program managers

Recommendation: NEEA should focus future efforts on developing resources that can benefit the region as a whole, such as trainings and educational efforts. Due to the variations in local markets across the region, developing specific programs may not be the best use of NEEA’s resources.

7. APPENDIX A: UTILITY LIGHTING PROGRAM OFFERINGS

HMG reviewed the existing lighting programs listed below. Programs are listed by utility territory and then by program name. The outline also shows the target audience for each program.

- ◆ Avista
 - Commercial Lighting Incentive Program
 - Commercial buildings
- ◆ Bonneville Power Administration (BPA)
 - Energy Smart Design
 - New small offices
 - Lighting Calculator 2.3
 - Commercial
 - T8 Lighting Project
 - Smaller BPA utilities
- ◆ Chelan PUD
 - Resource Smart
 - Commercial
- ◆ Clark PUD
 - Commercial/Industrial Lighting Incentive Program (CLIP)
 - Commercial and industrial
- ◆ Cowlitz
 - Commercial Energy Efficiency Program (CEEP) Plus Lighting Offer
 - Commercial
- ◆ Emerald PUD
 - Lighting Retrofit: EPUD Lighting Calculator
 - Commercial
- ◆ Energy Trust of Oregon
 - Lighting and Lighting Controls
 - Residential, commercial, industrial. New construction and existing buildings.
- ◆ EWEB

- New Construction Lighting
 - Commercial new construction
- Retrofit Lighting
 - Commercial retrofits
- Small Business Lighting
 - Less than 5000 watts of interior lighting
- ◆ Flathead Electric
 - Commercial Lighting New Construction Incentive Program
 - Commercial new construction
 - Commercial Lighting Retrofit Incentive Program
 - Commercial retrofits
- ◆ Grant PUD
 - New Construction Incentives Program
 - Commercial new construction
 - Retrofit Incentive Program
 - Commercial retrofits
- ◆ Idaho Power
 - Building Efficiency
 - Large commercial
 - Custom Efficiency
 - Large custom projects
 - Easy Upgrade
 - Small retrofits
- ◆ NorthWestern Energy
 - Commercial Lighting Rebate Program
 - Commercial new construction and existing buildings
- ◆ Pacific Power
 - Energy FinAnswer
 - New construction and large retrofits
 - FinAnswer Express

- New construction
- ◆ Peninsula Light
 - Commercial Lighting Rebate Program
 - Commercial
- ◆ Puget Sound Energy
 - Commercial Custom Grant
 - Commercial and industrial
 - Enhanced Lighting Program
 - Commercial and industrial
 - Small Business Lighting
 - Small business
- ◆ Seattle City Light
 - Special Offer Incentives
 - Medium and large commercial
 - Special Offer Incentives
 - Small commercial
- ◆ Snohomish
 - Lighting System Rebates
 - Commercial
- ◆ Tacoma Power
 - Bright Rebates
 - Commercial and small commercial

8. APPENDIX B: UTILITY PROGRAM MANAGER SURVEY INSTRUMENT

This section reproduces the utility program manager survey instrument developed by Market Strategies International (MSI), in coordination with the NEEA and HMG.

NEEA Comprehensive Commercial Lighting Initiative (CCLI) 2012 Utilities Survey

Study objectives	Establish baseline measures for the Comprehensive Commercial Lighting Initiative (CCLI) among utility lighting program managers in the Northwest: <ul style="list-style-type: none"> Identify the program offerings from Northwest utilities related to commercial lighting Identify barriers to establishing comprehensive commercial lighting programs with utility customers 		
Qualified respondent	Respondent identified in sample: Need to include in survey (census, n=16)	INCLUDE=1	
	▪ Other utility program managers (n=80)	INCLUDE=2	
Sample size	n=96		
Incidence	90% (estimated)		
Length	30 minutes (estimated)		
Sample source(s)	Client list		
Front-end sample move-ins	<Front end sample move ins> (TBD)		
Back-end sample move-ins	<Back end sample move ins> (TBD)		
Logo?	NEEA logo will be provided for online survey		
Previous button?	Allow		
Collect contact info?	No		
Quotas	Description	Desired n (Actual n)	Definition
	Include in survey (census, n=16)	16	INCLUDE=1
	▪ Other utility program managers (n=80)	36+ (as many as possible)	INCLUDE=2
Tracking variables	Survey Test Participant (n=6)		SURVEY_TEST=1
	Lighting Work Group Participant (n=20)		LGW=1
	NEEA Pilot Participant (n=6)		NEEA_PILOT_PART=1
	Others (n=70)		LGW=2 AND NEEA_PILOT_PART=2

NOTE: Sample disposition code key

101–199: Screen out questions	101	S1=2, DK
	102	
	103	
	104	
	105	
	106	
	107	
	108	
	109	
	110	
201–299: Over quotas	201	
301–399: Codes for refusals	301	S1=REF
	302	

NOTE: Sample Move-ins

DESIGN: SET VARIABLE

2
3 UTILITY.: UTILITY NAME
 [OPEN END: S]

break

DESIGN: SET VARIABLE

4 UTILITY_TYPE. UTILITY TYPE
 [OPEN END: S]

break

DESIGN: SET VARIABLE

5 CITY. CITY
 [OPEN END: S]

break

DESIGN: SET VARIABLE

6 STATE. STATE
 [OPEN END: S]

break

DESIGN: SET VARIABLE

7 REPRESENTATIVE. REPRESENTATIVE
 [OPEN END: S]

break

DESIGN: SET VARIABLE

8 PHONE. PHONE NUMBER
 [OPEN END: S]

break

DESIGN: SET VARIABLE

9 EMAIL. EMAIL ADDRESS
 [OPEN END: S]

break

DESIGN: SET VARIABLE

10 NEEA_PILOT_PART. NEEA PILOT PARTICIPANT

- 1 Yes
- 2 No

break

DESIGN: SET VARIABLE

11 LWG. LIGHTING WORK GROUP PARTICIPANT

- 1 Yes
- 2 No

break

DESIGN: SET VARIABLE

12 INCLUDE. SHOULD INCLUDE IN SURVEY

- 1 Need to include
- 2 Others

break

DESIGN: SET VARIABLE

13 SURVEY_TEST. SURVEY TEST

- 1 Yes
- 2 No

break

DESIGN: SET VARIABLE

14 LEFT_MSSG. LEFT MESSAGE

- 1 Yes
- 2 No

break

DESIGN: SET VARIABLE

15 QUOTA1. Tracking Variable

- 1 {SET IF LGW=2 AND NEEA_PILOT_PART=2} Others
- 2 {ELSE}

break

NOTE: INTRODUCTION

Welcome to the Northwest Energy Efficiency Alliance (NEEA) commercial lighting retrofit survey. This study is being conducted on behalf of NEEA by Market Strategies to help NEEA better understand the commercial lighting market, to get a snap shot of current utility lighting retrofit program offerings in the region, and where these programs may be headed in the near future.

The results of this confidential survey, along with additional research into trade ally skill sets and an overall commercial lighting market characterization study, will help inform NEEA's efforts in the commercial lighting market. Through this research and some pilot efforts in the region we can, together, develop regional strategies that will work in partnership with local utility programs to help the region achieve deeper, more comprehensive savings from commercial lighting retrofit projects. This work will also help prepare all of us in the rapidly transforming lighting market including the mid-2012 changes in the federal standards for linear fluorescents.

The survey should take approximately 30 minutes to complete, and all answers will be strictly confidential.
break

NOTE: SCREENER QUESTIONS

S1. Does your work involve developing, implementing, or coordinating your utility's lighting retrofit programs for commercial customers?

- 1 Yes
- 2 No
- DK

{IF S1=2, DK, TERMINATE: 101}

BREAK

DESIGN: MULTI ORDER

S2. Which of the following best describes your job responsibilities?
(Please select all that apply.)

- 1 Lighting program coordination and management
- 2 Energy efficiency or conservation program coordination or management
- 3 Account management
- 4 Customer service
- 5 Program evaluation
- 6 Program planning and development
- 7 General management
- 8 Other [OTHER: S]
- DK

break

S3 Are you an Option 1 public utility customer of the Bonneville Power Administration implementing a standard program using the BPA standard offer and lighting calculator?

- 1 Yes
- 2 No
- DK

break

{IF S3=1, ASK S4; OTHERWISE GO TO Q1}

DESIGN: MULTI ORDER

S4 How have you modified BPA's standard offer to meet your program objectives?
(Please select all that apply.)

- 1 I have not modified BPA's standard offer.
 - 2 I have modified incentive levels for specific measure categories.
 - 3 I have modified total project cost caps.
 - 4 I have excluded certain measure categories or technologies.
 - 5 I have used "non-standard measures" to include technologies not available in the offer.
 - 6 Other [OTHER: S].
- DK

NOTE: STANDARD LIGHTING RETROFIT PROGRAMS

DESIGN: MULTI ORDER

The first few questions are about your current, standard lighting retrofit incentives for commercial customers. These questions apply only to these “standard” incentives, not to “custom” incentives that require additional calculations or verification (even if those custom incentives are available within the standard program).

Q1. Which types of standard lighting retrofit program incentives do you currently offer to commercial customers?

(Please select all that apply.)

- 1 Fixed financial incentives based on equipment installed or new control devices
 - 2 Per kWh incentives from estimated reductions in lighting energy use (i.e. installed power multiplied by hours of use)
 - 3 Incentives specifically for lighting design work
 - 4 Other [OTHER: S]
- DK

break

DESIGN: MULTI ORDER

{IF Q1=1, ASK Q1A; OTHERWISE GO TO Q2}

Q1A For programs using fixed incentives based on equipment installed, are incentives structured to pay more for any of the following.

(Please select all that apply.)

- 1 A reduction in the number of lamps when upgrading multi-lamp fixtures
 - 2 A reduction in the number of lamps by delamping currently installed fixtures
 - 3 Installation of low wattage lamps or low ballast factor ballasts
 - 4 A reduction in the number of fixtures when upgrading multiple fixtures
 - 5 Installation of lighting controls
 - 6 Other [OTHER: S]
- DK

break

DESIGN: MULTI ORDER

Q2. What performance requirements are placed on projects within your standard lighting retrofit programs?

(Please select all that apply.)

- 1 Project must meet IES illuminance requirements or other light level requirements
 - 2 Project must achieve certain minimum savings versus baseline
 - 3 Project must reduce energy use below a certain kWh or kW per square foot threshold
 - 4 Project must meet or exceed local energy code
 - 5 Project must include certain basic controls
 - 6 Projects must address all opportunities of certain types (e.g., exit signs, T-12s, etc. must be addressed if present)
 - 7 Other [OTHER: S]
- DK

break

{IF Q2=1, ASK Q3A; OTHERWISE GO TO FILTER BEFORE Q3B}

Q3A. Please briefly describe the IES illuminance or other light level requirements for your standard lighting retrofit programs.

[OPEN END: L]

break

{IF Q2=2 OR 3, ASK Q3B; OTHERWISE GO TO FILTER BEFORE Q3C}

Q3B. Please briefly describe the minimum energy savings or energy use requirements for your standard lighting retrofit programs.

[OPEN END: L]

break

{IF Q2=4, ASK Q3C; OTHERWISE GO TO FILTER BEFORE Q3D}

Q3C. Please briefly describe the local energy code requirements for your standard lighting retrofit programs.

[OPEN END: L]

break

{IF Q2=5, ASK Q3D; OTHERWISE GO TO FILTER BEFORE Q3E}

Q3D. Please briefly describe the basic controls required for your standard lighting retrofit programs.

[OPEN END: L]

break

{IF Q2=6, ASK Q3E; OTHERWISE GO TO Q4A}

Q3E. Please briefly describe the requirements around addressing all opportunities, for your standard lighting retrofit programs.

[OPEN END: L]

break

Q4A. Do your custom incentives include escalating incentive rate “tiers” or any other escalating incentive, designed to promote deeper savings?

1 Yes

2 No

DK

break

{IF Q4A=1, ASK Q4B; OTHERWISE GO TO Q4E}

Q4B. Are your escalating incentives based on the amount of energy saved, lighting power densities, or something else?

1 kWh saved, compared to building code

2 kWh saved, compared to existing building

3 Lighting power density targets

4 An equipment specification (e.g., high efficiency troffers, or a controls package)

5 Other [OTHER: S]

DK

break

Q4BB. How is the escalating incentive calculated?

1 Increasing “Tiers” of cents per kWh

2 Fixed incentive payments

3 A combination of fixed and variable incentives (e.g., per kWh rates with bonuses triggered at certain thresholds)

4 Other [OTHER: S]
DK

break

Q4C. Broadly, what are the eligibility requirements for each tier?

[OPEN END: L]

break

Q4D. What are the “cents per kWh” incentive rates associated with those tiers?

[OPEN END: L]

break

Q4E. Are the kWh savings from the retrofit calculated relative to the existing conditions in the building?

1 Yes

2 No

DK

break

{IF Q4E=2 ASK Q4F; OTHERWISE GO TO Q5}

Q4F. Please explain why the kWh savings from the retrofit are not calculated relative to the existing conditions in the building?

[OPEN END: L]

break

Q5. Do your standard lighting retrofit programs include incentives for the installation of lighting controls?

1 Yes

2 No

DK

break

{IF Q5=1, ASK Q5A; OTHERWISE GO TO Q8A}

Q5A Do control incentives vary by type of control in your program?

1 Yes

2 No (all controls receive either the same fixed incentive, or the same percentage savings)

DK

break

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q6A–Q6I

For each type of ‘lighting controls’ listed below, please indicate if it is eligible for incentives as part of your standard lighting retrofit programs.

1 Eligible, receives a fixed incentive

2 Eligible, receives a calculated incentive

3 Not eligible

DK

Q6A. Occupancy sensors

- Q6B. Photocontrols
- Q6C. Time sweep controls
- Q6D. Manual dimming controls
- Q6E. Centralized (“tuned”) dimming controls
- Q6F. Demand response controls
- Q6G. Addressable controls
- Q6H. Egress lighting shut-off controls
- Q6I. Astronomical time clocks

break

{IF Q6A =1 OR Q6B=1 OR Q6C=1 OR Q6D=1 OR Q6E=1 OR Q6F=1 OR Q6G=1 OR Q6H=1 OR Q6I=1; ASK Q6J; OTHERWISE GO TO Q7A}

DESIGN: MULTI ORDER

Q6J. If controls receive a fixed incentive, is the incentive based on?

(Please select all that apply.)

- 16 Controlled wattage
- 17 Building type
- 18 Type of control
- 19 Type of fixture controlled
- 20 Other [OTHER: S]
- DK

break

{ASK THE Q7A IF Q5=1; OTHERWISE FILTER BEFORE Q8A}

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q7A–Q7I

For each type of ‘lighting controls’ listed below, please indicate if it is mandatory for at least some space types as part of your standard lighting retrofit programs.

- 1 Not mandatory
- 2 Mandatory for at least some space types
- DK

- Q7A. Occupancy sensors
- Q7B. Photocontrols
- Q7C. Time sweep controls
- Q7D. Manual dimming controls
- Q7E. Centralized (“tuned”) dimming controls
- Q7F. Demand response controls
- Q7G. Addressable controls
- Q7H. Egress lighting shut-off controls
- Q7I. Astronomical time clocks

break

{IF Q1=1, ASK Q8A; OTHERWISE GO TO Q9}

Q8A. Is task lighting eligible for incentives as part of your standard lighting retrofit programs?

- 1 Yes
- 2 No, but we will provide an incentive in 2012
- 3 No, and we do not plan to provide an incentive in 2012
- DK

break

Q8B. Are smart plug strips (with occupancy sensors) eligible for incentives as part of your standard lighting retrofit programs?

1 Yes

2 No, but we will provide an incentive in 2012

3 No, and we do not plan to provide an incentive in 2012

4 No, but incentives for smart plug strips are available through another program

DK

break

NOTE: "CUSTOM" LIGHTING RETROFIT PROGRAM ELEMENTS

We understand that many utilities also offer additional "custom" elements as part of their lighting retrofit programs. These custom elements are often claimed for complex projects or for advanced technologies. Custom incentives can be provided either within standard programs, or within a specialized custom program. These next few questions are about the incentive structure and program requirements for these custom incentives.

Q9. Do you offer custom incentives for lighting retrofit projects?

- 1 Yes
- 2 No
- DK

break

{IF Q9=1, ASK Q9A; OTHERWISE GO TO Q19}

Q9A. What are the general qualification criteria for custom incentives? (e.g., size of project, type of project, kWh saved, total incentive, equipment type)

[OPEN END: L]

break

NOTE: DELETED Q10

DESIGN: MULTI ORDER

Q11. Which types of custom incentives do you currently offer to commercial customers?

(Please select all that apply.)

- 1 Fixed financial incentives based on equipment installed change-outs
- 2 Per kWh incentives calculated from lighting energy use reductions (i.e., installed power multiplied by hours of use)
- 3 Per kW incentives calculated from lighting power reductions
- 4 Incentives specifically for lighting design work
- 5 Other [OTHER: S]

DK

break

{IF Q11=2 OR 3, ASK Q11A; OTHERWISE GO TO Q12}

Q11A. On average, what is the relative incentive cost of the custom incentive program compared to the standard (prescriptive) program?

- 1 The per kWh (or per kW) incentive cost is greater in the custom incentive program
- 2 The per kWh (or per kW) incentive cost is less in the custom incentive program
- 3 The standard program and custom incentive programs have the same per kWh (or per kW) incentive cost

DK

break

DESIGN: MULTI ORDER

Q12. What performance requirements are placed on projects with custom incentives?
(Please select all that apply.)

- 1 Project must meet IES illuminance requirements or other light level requirements
 - 2 Project must achieve certain minimum savings versus baseline
 - 3 Project must reduce energy use below a certain kWh or kW per square foot threshold
 - 4 Project must meet or exceed local energy code
 - 5 Project must include certain basic controls
 - 6 Projects must address all opportunities of certain types (e.g., exit signs, T-12s, etc. must be addressed if present)
 - 7 Other [OTHER: S]
- DK

break

{IF Q12=1, ASK Q13A; OTHERWISE GO TO FILTER BEFORE Q13B}

Q13A. Please briefly describe the IES illuminance or other light level requirements for custom incentives.

[OPEN END: L]

break

{IF Q12=2 OR 3, ASK Q13B; OTHERWISE GO TO FILTER BEFORE Q13C}

Q13B. Please briefly describe the minimum energy savings or energy use requirements for custom incentives.

[OPEN END: L]

break

{IF Q12=4, ASK Q13C; OTHERWISE GO TO FILTER BEFORE Q13D}

Q13C. Please briefly describe the local energy code requirements for custom incentives.

[OPEN END: L]

break

{IF Q12=5, ASK Q13D; OTHERWISE GO TO FILTER BEFORE Q13E}

Q13D. Please briefly describe the basic controls required for custom incentives.

[OPEN END: L]

break

{IF Q12=6, ASK Q13E, OTHERWISE GO TO Q14A}

Q13E. Please briefly describe the requirements around addressing all opportunities for custom incentives.

[OPEN END: L]

break

Q14A. Do your custom incentives include escalating incentive rate “tiers” or any other escalating incentive, designed to promote deeper savings?

- 1 Yes
 - 2 No
- DK

break

{IF Q14A=1, ASK Q14B; OTHERWISE GO TO Q14E}

Q14B. Are your escalating incentives based on the amount of energy saved, lighting power densities, or something else?

- 1 kWh saved, compared to building code
- 2 kWh saved, compared to existing building
- 3 Lighting power density targets
- 4 An equipment specification (e.g., high efficiency troffers, or a controls package)
- 5 Other [OTHER: S]
- DK

break

Q14BB. How is the escalating incentive calculated?

- 1 Increasing "Tiers" of cents per kWh
- 2 Fixed incentive payments
- 3 A combination of fixed and variable incentives (e.g., per kWh rates with bonuses triggered at certain thresholds)
- 4 Other [OTHER: S]
- DK

break

{IF Q14BB=1, ASK Q14C; OTHERWISE GO TO Q14E}

Q14C. What are the eligibility requirements for each tier?

[OPEN END: L]

break

Q14D. What are the "cents per kWh" incentive rates associated with those tiers?

[OPEN END: L]

break

Q14E. Are the kWh savings from the retrofit calculated relative to the existing conditions in the building?

- 1 Yes
- 2 No
- DK

break

{IF Q14E=2, ASK Q14F; OTHERWISE GO TO Q15}

Q14F. Please explain why the kWh savings from the retrofit are not calculated relative to the existing conditions in the building?

[OPEN END: L]

break

Q15. Do you offer custom incentives for the installation of lighting controls?

- 1 Yes
- 2 No
- DK

break

{IF Q15=1, ASK Q15A; OTHERWISE GO TO Q18A}

Q15A Do control incentives vary by type of control in your program?

- 1 Yes

- 2 No (all controls receive either the same fixed incentive, or the same percentage savings)
DK

break

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q16A–Q16I

For each type of 'lighting controls' listed below, please indicate if custom incentives are offered.

- 1 Eligible, receives a customized fixed incentive
2 Eligible, receives a customized calculated incentive
3 Not eligible
DK

- Q16A. Occupancy sensors
Q16B. Photocontrols
Q16C. Time sweep controls
Q16D. Manual dimming controls
Q16E. Centralized ("tuned") dimming controls
Q16F. Demand response controls
Q16G. Addressable controls
Q16H. Egress lighting shut-off controls
Q16I. Astronomical time clocks

break

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q17A–Q17I

For each type of 'lighting controls' listed below, please indicate if it is mandatory for at least some space types as part of your custom lighting retrofit programs.

- 1 Not mandatory
2 Mandatory for at least some space types
DK

- Q17A. Occupancy sensors
Q17B. Photocontrols
Q17C. Time sweep controls
Q17D. Manual dimming controls
Q17E. Centralized ("tuned") dimming controls
Q17F. Demand response controls
Q17G. Addressable controls
Q17H. Egress lighting shut-off controls
Q17I. Astronomical time clocks

break

{IF Q11=1, ASK Q18A; OTHERWISE GO TO Q19}

- Q18A. Is task lighting eligible for prescriptive equipment change-out incentives as part of your custom lighting retrofit programs?

- 1 Yes
- 2 No, but we will provide an incentive in 2012
- 3 No, and we do not plan to provide an incentive in 2012
- DK

break

Q18B. Are smart plug strips (with occupancy sensors) eligible for 1:1 equipment change-out incentives as part of your custom lighting retrofit programs?

- 1 Yes
- 2 No, but we will provide an incentive in 2012
- 3 No, and we do not plan to provide an incentive in 2012
- 4 No, but incentives for smart plug strips are available through another program
- DK

break

Q19. Please describe any other types of lighting retrofit programs or services you offer commercial customers that have not been covered via the questions about your standard programs and custom incentives.

[OPEN END: L]

break

NOTE: TRAINING / TECHNICAL / MARKETING SUPPORT OFFERED TO TRADE ALLIES AND CUSTOMERS

Q20. Does your utility offer training and/or technical services to electrical contractors regarding lighting upgrades and retrofits?

- 1 Yes
- 2 No
- DK

break

{IF Q20=1, ASK Q21A; OTHERWISE GO TO Q22A}

Q21A. What types of training and/or technical services are offered to trade allies / electrical contractors regarding lighting design and illuminance calculations?

- 1 Lighting quality criteria such as illuminance, uniformity and color rendering
- 2 Lighting design templates such as the Advanced Lighting Guidelines, or the DOE's Commercial Building Initiative
- 3 Lighting design calculations and/or software
- 4 Other [OTHER: S]
- DK

break

Q21B. What types of training and/or technical services are offered to trade allies / electrical contractors regarding the design and installation of lighting control systems?

- 1 Design and specification of controls systems
- 2 Installation and commissioning of control systems
- 3 Other [OTHER: S]
- DK

break

Q22A. Apart from the Lighting Design Labs, does your program provide design review to contractors or customers who are taking part in the program?

- 1 No
- 2 No, but the program provides information about design review services
- 3 Yes, design review is available for some projects
- 4 Yes, design review is available for all projects
- 5 Yes, design review is mandatory for some projects
- 6 Yes, design review is mandatory for all projects
- DK

break

{IF Q22A=3, ASK Q22B; OTHERWISE GO TO Q22D}

Q22B. What projects do you provide optional design review for?

[OPEN END: L]

break

{IF Q22A=5, ASK Q22D; OTHERWISE GO TO Q23A}

Q22D. What projects are required to undergo design review?

[OPEN END: L]

break

Q23A. Does your utility offer any “marketing” support to trade allies (e.g., “top performing” recognition, awards, PR, etc.)?

- 1 Yes
- 2 No
- DK

break

{IF Q23A=1, ASK Q23B; OTHERWISE GO TO Q24A}

Q23B. Please describe the type(s) of marketing support is offered to trade allies.

[OPEN END: L]

break

Q24A. Are customers required to work with a utility-approved contractor to take part in a lighting retrofit program?

- 1 Yes, customers must work through an approved contractor
- 2 No, but we provide a list of recommended contractors
- 3 No, but approved contractors have access to additional incentives or services
- 4 No, we do not provide referrals for approved or recommended contractors
- DK

break

{IF Q24A=1 OR 3, ASK Q24B; OTHERWISE FILTER BEFORE Q25}

Q24B. What are the requirements for a contractor to be “approved” for lighting retrofit programs, and what does the contractor have to do to remain on the approved list?

[OPEN END: L]

break

NOTE: FUTURE LIGHTING PROGRAMS

We would like to know your thoughts about the impact of the forthcoming Federal standards for linear fluorescent lamps. The EPACKT legislation becomes effective July 14, 2012, and raises the minimum efficacy of linear fluorescent lamps. Almost all current T-12 lamps are non-compliant with this new standard, and therefore cannot be sold once existing stocks run out. We would like to learn more about how you think this will impact your programs directly and plans for the future.

Q25. How do you anticipate the federally mandated phase-out of T-12 lamps in mid-2012 and T-12 ballasts in 2013 will impact your commercial lighting program offerings going forward?

[OPEN END: L]

break

Q26. What percentage of your current program savings is related to T-12 change-outs?
(Your best estimate is fine.)

[RECORD NUMBER 1–100]%
DK

break

Q26A. If your utility's program were not modified, what percentage of your savings would you expect to lose because of program or baseline changes resulting from the forthcoming Federal standards?
(Your best estimate is fine.)

[RECORD NUMBER 1–100]%
DK

break

Q27. What changes do you plan to make to the incentives for T-12 lamps?

- 1 Stop the T-12 incentive entirely
 - 2 Decrease the T-12 incentive to a much lower level
- DK

break

Q27A. How do you plan to count T-12 savings after the new Federal rules go into effect?

- 1 Stop counting T-12 retrofit savings
 - 2 Count T-12 retrofit savings at a lower (discounted) level
 - 3 Continue counting T-12 retrofit savings in the same way you do now
 - 4 Other [OTHER: S]
- DK

break

DESIGN: SAME SCREEN Q28M–Q28Y

{IF Q27=1-2, ASK Q28; OTHERWISE GO TO Q29}

When does your utility plan to {SHOW IF Q27=1: stop the T-12 incentive entirely} {SHOW IF Q27=2: decrease the T-12 incentive to a much lower level}?

Q28M. Please enter month (1-12).

[RECORD NUMBER 1–12]
DK

Q28Y. Please enter year.

[RECORD NUMBER 2012-2075]
DK

break

Q29. What other plans does your utility have in place to modify its lighting retrofit program(s) in response to the T-12 phase-out?

[OPEN END: L]

break

Q30. Beyond plans made in response to the T-12 phase-out, does your utility have any other specific plans for future development of its commercial lighting programs?

- 1 Yes
- 2 No
- DK

break

{IF Q30=1, ASK Q31A; OTHERWISE GO TO Q32A}

DESIGN: MULTI ORDER

Q31A. Which of the approaches below is your utility using to develop its future lighting programs?
Select all that apply.

- 1 We are developing a new program internally or with help from consultants
- 2 We are planning to collaborate with another utility or agency to develop our program
- 3 We are planning to adopt a whole lighting program from another utility or agency
- 4 Other [OTHER: S]
- DK

break

{IF Q31A=2-3, ASK Q31B; OTHERWISE GO TO Q32A}

Q31B. Which utilities or agencies will you be working with to develop your program?

[OPEN END: L]

break

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q32A–Q32H

Please indicate the likelihood that your utility will offer each of the following in its commercial lighting retrofit programs three years from now.

- 1 Definitely will not
- 2 Probably will not
- 3 Probably will
- 4 Definitely will
- 5 This is already offered by the program
- DK

Q32A. Fixed financial incentives based on 1:1 equipment change-outs

Q32B. Per-kWh incentives (calculated from lighting power reductions multiplied by lamp hours of use per year)

Q32C. Incentives specifically for lighting design work

Q32D. Incentives for the installation of lighting controls

Q32E. Escalating incentive rate “tiers” based on how much energy is being saved, or on lighting power densities

Q32F. A “custom” lighting retrofit program

Q32G. Training and/or technical services to electrical contractors regarding lighting upgrades and retrofits

Q32H. Owner education / marketing on quality lighting projects

break

DESIGN: FLIP CODE DISPLAY 1–4

Q33. How likely is your utility to offer additional incentives to encourage customers to achieve deeper lighting savings in their buildings within the next three years?

- 1 Definitely will not
- 2 Probably will not
- 3 Probably will
- 4 Definitely will
- 5 We already offer incentives specifically designed to encourage deeper savings
- DK

break

NOTE: BARRIERS TO IMPLEMENTATION OF LIGHTING PROGRAMS

Now, we would like to get your perspective and experience on the challenges facing future lighting programs for the commercial market.

Q34. What obstacles or challenges do you see in the marketplace that could hinder the successful development and implementation of new lighting programs over the next few years?

[OPEN END: L]

break

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q35A–Q35P

For each potential barrier below that trade allies and your commercial customers may need to overcome in order to implement future lighting retrofits, please indicate how important it will be to address that barrier over the next few years.

- 1 Not important to address
- 2 Somewhat important to address
- 3 Very important to address
- 4 Extremely important to address
- 5 I do not believe this is a barrier
- DK

- Q35A. Lack of customer motivation to pursue deeper savings due to the longer payback time
- Q35B. Lack of customer awareness of the added benefits of high quality, best practice lighting design (e.g., worker retention, productivity improvement)
- Q35C. Customer distrust about the performance of lighting control systems
- Q35D. Lack of trade ally skills required to propose, sell, and deliver a well-designed lighting retrofit project
- Q35E. Additional paperwork for trade allies caused by more complex projects
- Q35G. Confusion caused by utilities offering multiple lighting incentive programs to each customer
- Q35H. Disruption to the customer's business activities caused by the need to replace fixtures and/or add controls
- Q35I. Additional trade ally labor required to design deeper lighting retrofit projects, compared with 1:1 equipment replacement projects
- Q35J. Additional customer labor required to design lighting retrofit projects, compared with 1:1 equipment replacement projects
- Q35K. Potential project delays caused by the increased complexity of the projects
- Q35L. Additional up-front cost to the customer of the project, thus hard to sell
- Q35M. Concerns about degradation of visual environment with a retrofit project that attempts deeper savings
- Q35N. Lack of trade ally expertise in fine-tuning lighting controls to optimize savings
- Q35O. Concerns about on-going maintenance problems and costs due to equipment failure, and trade ally call backs
- Q35P. The continued availability of simpler utility programs that the customer or trade ally may find easier to take part in

break

Q36. Please describe any other obstacles facing trade allies and commercial customers implementing future “comprehensive” lighting retrofits that need to be addressed in the next few years.

[OPEN END: L]

break

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q37A–Q37J

For each action below, please indicate whether or not you think your utility would consider taking that action to help increase lighting energy savings in the Northwest region.

- 1 Would definitely not consider
 - 2 Would probably not consider
 - 3 Would probably consider
 - 4 Would definitely consider
 - 5 My utility has already done this
- DK

Q37A. Assist with locating willing “first adopter” contractors and customers for comprehensive lighting solution pilots.

Q37B. Provide increased incentives for lighting upgrades that take a comprehensive, redesign approach and offer deeper savings.

Q37C. Offer tiered incentives based on overall kWh reductions relative to code.

Q37D. Increase program requirements for advanced technologies to help move the market toward more comprehensive lighting projects.

Q37E. Increase program requirements for evidence of optimized lighting designs to help move the market toward more comprehensive lighting projects.

Q37F. Partner with the rest of the region’s utilities in the development of comprehensive lighting marketing tools and trainings for trade allies.

Q37G. Partner with the rest of the region’s utilities in the development of comprehensive lighting marketing tools to help educate owners on the benefits of high quality, energy efficient lighting.

Q37H. Partner with the rest of the region’s utilities in delivering comprehensive lighting training.

Q37I. Explore financial assistance for trainings and certifications for contractors.

Q37J. Participate in group “buy-downs” from manufacturers of target technology to increase adoption in NW.

break

Q38. Please describe any other actions your utility would consider taking to help increase lighting energy savings in the Northwest region.

[OPEN END: L]

break

DESIGN: MULTI ORDER, RANDOMIZE CODES 1–11

Q39. Now thinking about what NEEA can do to help increase lighting energy savings in the Northwest region, please indicate which roles and strategies NEEA could undertake to best help your utility achieve its commercial lighting retrofit goals.

(Please select all that apply.)

- 1 Develop a regional lighting certification program that works to improve the skill sets of trade allies / electrical contractors
- 2 Develop regional marketing tools to educate customers on the benefits of deeper, more comprehensive lighting retrofits
- 3 Develop regional marketing tools to help “top performing” and high quality trade allies differentiate their abilities in the marketplace
- 4 Provide regional “design” services for trade allies
- 5 Develop a regional “hub” of resources for trade allies / electrical contractors serving utility programs
- 6 Target, train and work with regional distributors and manufacturer representatives to help deliver more comprehensive lighting retrofit projects
- 7 Support the demonstration of new technologies
- 8 Improve existing tools for lighting redesign so they are more applicable to the retrofit market rather than new construction projects
- 9 Improve existing lighting calculator tools to include more accurate assessments of savings from controls
- 10 Coordinate the sharing of tools and resources between utilities to help the market process more complex lighting retrofit projects
- 11 Develop a new program to incentivize deeper lighting retrofits

DK

break

21

Q41. And finally, what are the most important things NEEA can do to help your utility achieve its commercial lighting retrofit goals?

[OPEN END: L]

break

22

Thanks for taking the time to participate in our survey. Your responses will help inform the development of future regional lighting retrofit program offerings.

[END OF SURVEY]

9. APPENDIX C: TRADE ALLY SURVEY INSTRUMENT

This section reproduces the trade ally survey instrument developed by Market Strategies International (MSI), in coordination with the NEEA and HMG.

NEEA Comprehensive Commercial Lighting Initiative (CCLI) - 2012 Trade Allies Survey Questionnaire (online)

Study objectives	<ul style="list-style-type: none"> • Provide a comprehensive overview of the standard practices of market actors involved in retrofit projects, prior to the possible widespread implementation of “comprehensive” lighting programs. When NEEA conducts similar surveys in future, NEEA will be able to track progress in standard practices over time, and potentially attribute them to program activities. • To assess barriers to comprehensive lighting solutions, as well as issues that would not be apparent from project review such as technical training and market expectations. The survey will also address trade allies’ expectations regarding the forthcoming T12 lamp and ballast phase-out as a result of EISA regulations. 		
Qualified respondent	Respondent identified in sample: - Does lighting retrofit work for Commercial and Industrial sector customers		
Sample size	As many as the client supplied sample will yield		
Incidence	70% (estimated)		
Length	25 minutes (estimated)		
Sample source(s)	Client list		
Front-end sample move-ins	SAMPLE, SAMPLEID, COMPANY, BUSINESS_TYPE, CITY, STATE, MAIN_CONTACT, PHONE, EMAIL, CL_PILOT_PART, UTILITY		
Back-end sample move-ins	None		
Logo?	NEEA logo will be provided for online survey		
Previous button?	Yes		
Collect contact info?	No		
Quotas	Description	Desired n (Actual n)	Definition
	None		
Tracking variables	CL Pilot Participant		
	Utilities partner with? (sample variables)		

NOTE: Sample disposition code key

101–199: Screen out questions	101	S1=DK
	102	S2=DK or >25%
	103	S2a and S2b < 50%
	104	S3=DK
	105	S4=0 or DK
	106	
	107	
	108	
	109	
	110	
201–299: Over quotas	201	
301–399: Codes for refusals	301	S1=REF
	302	

NOTE: Front-end sample move-ins

DESIGN: SET VARIABLE

b. SAMPLE. Sample source.

1 Client-supplied

break

DESIGN: SET VARIABLE

c. SAMPLEID. Unique ID from sample provider.

[OPEN END: S]

break

DESIGN: SET VARIABLE

d.

e. COMPANY. COMPANY NAME

[OPEN END: S]

break

DESIGN: SET VARIABLE

f.

g. BUSINESS_TYPE. BUSINESS TYPE

[OPEN END: S]

break

DESIGN: SET VARIABLE

h.

i. CITY. CITY

[OPEN END: S]

break

DESIGN: SET VARIABLE

j.

k. STATE. STATE

[OPEN END: S]

break

DESIGN: SET VARIABLE

l.

m. MAIN CONTACT. MAIN CONTACT (NAME)

[OPEN END: S]

break

DESIGN: SET VARIABLE

n.

o. PHONE. PHONE NUMBER

[OPEN END: S]

break

DESIGN: SET VARIABLE

p.
q. EMAIL. EMAIL ADDRESS

[OPEN END: S]

break

DESIGN: SET VARIABLE

r.
s. CL_PILOT_PART. CL PILOT PARTICIPANT

1 Yes
2 No

break

DESIGN: SET VARIABLE

t.
u. WEBSITE. CL Website

[OPEN END: S]

break

DESIGN: SET VARIABLE

v.
w. SCL. SCL

1 Yes
2 No

break

DESIGN: SET VARIABLE

x.
y. NWEn. NWEN

1 Yes
2 No

break

DESIGN: SET VARIABLE

z.
aa. NW TAN. NW Tan

1 Yes
2 No

break

DESIGN: SET VARIABLE

bb.
cc. ETONW TAN. ETONW Tan

1 Yes
2 No

break

DESIGN: SET VARIABLE

dd.
ee. TAC POWER. Tac Power

1 Yes

2 No

break

DESIGN: SET VARIABLE

ff.

gg. PSE. PSE

1 Yes

2 No

break

DESIGN: SET VARIABLE

hh.

ii. AVISTA. Avista

1 Yes

2 No

break

DESIGN: SET VARIABLE

jj.

kk. IDAHO. Idaho

1 Yes

2 No

break

DESIGN: SET VARIABLE

ll.

mm. # LISTS. Number of Lists

[OPEN END: S]

break

DESIGN: SET VARIABLE

nn.

oo. TA PILOT PARTICIPANT. Trade Allies 2012 Pilot Participant

1 Yes

2 No

break

NOTE: INTRODUCTION

Welcome to the Northwest commercial and industrial lighting retrofit survey. This study is being conducted on behalf of the Northwest Energy Efficiency Alliance and their funding Northwest utilities (Washington, Oregon, Idaho and Montana) and efficiency organizations by Market Strategies to help the region better understand the commercial and industrial lighting retrofit market, and to help inform the development of possible future retrofit programs.

As you are well aware, the lighting market is undergoing a dramatic transformation with LED's, controls, new federal standards for linear fluorescents, and increased customer expectations for efficiency. To stay abreast of these changes energy efficiency organizations and utilities need to adapt to changes in the market. The results of this survey are very important to helping us develop new programs and regional resources that ultimately will help you as well continue to grow the commercial and industrial efficiency lighting market.

Your participation in this survey is anonymous and voluntary. Your individual answers will remain confidential and reported only in the aggregate, unless you choose to allow us to share your feedback directly with NEEA.

The survey should take approximately 25 minutes to complete, and all answers will be strictly confidential.

break

pp. SWEEP. Please indicate your preference of prize type for the drawing.

(Select one.)

- 1 iPad (\$500 value)
- 2 \$500 check
- 3 \$500 contribution to charity (American Red Cross, National Humane Society or Habitat for Humanity)
- REF Prefer not to answer

break

qq. AGE. Are you...?
(Select one.)

- 1 Younger than 18
- 2 18 or older
- REF Prefer not to answer

{IF AGE=REF, TERMINATE: 301}

{IF AGE=1, TERMINATE: 101}

break

NOTE: SCREENER QUESTIONS

The first few questions are about the types of services your company provides. For the purposes of the survey, the term "Northwest" refers to the states of Washington, Oregon, Idaho and Montana.

BREAK

DESIGN: MULTI BINARY,

rr. S1. Which of these activities does your company engage in?
ss. (Select all that apply.)

- 3 Manufacture lighting equipment
- 4 Represent lighting equipment manufacturers
- 5 Sell lighting equipment wholesale
- 6 Sell lighting equipment retail
- 7 Install commercial or industrial lighting equipment
- 8 Specify or advise on the design and layout of lighting equipment
- 9 Provide lighting design services
- 10 Provide lighting maintenance services
- 11 General electrical contracting
- 12 Other [OTHER: S]
- 13 None of the above
- DK

{IF S1=DK, TERMINATE: 301}

BREAK

DESIGN: SUM LE 100%

Please indicate the percentage of your individual work in the Northwest (Washington, Oregon, Idaho and Montana) that involves:

- *(Enter your responses as whole numbers in each of the boxes below. Educated guesses are fine.)*

[RECORD NUMBER 0–100]%

- S2_1. Lighting retrofits
- S2_2. Lighting tenant improvements
- S2_3. Lighting new construction
- S2_4. {OPT OUT CODES}

DK Not sure

{{IF S2_4=DK, TERMINATE: 301}}

break

DESIGN: SET VARIABLE

- tt. S2_NUM. What percentage of R's company's work involves lighting retrofits or tenant improvements?

[RECORD NUMBER 0–100]

{SET SUM (S2_1, S2_2)}

{IF S2_NUM=0–24, TERMINATE: 102}

break

DESIGN: SUM LE 100%

Considering all of the work you do (including lighting and non-lighting projects), please indicate the approximate percentage of your individual work in the Northwest that involves:

- *Enter your responses as whole numbers in each of the boxes below. Educated guesses are fine.)*

[RECORD NUMBER 0–100]%

- uu. S3_1. Commercial lighting retrofits (e.g. office, schools, retail, warehouse, etc.):
- vv. S3_2. Industrial lighting retrofits (e.g. manufacturing):
- ww. S3_3. Outdoor lighting:
- xx. S3_4. Residential lighting retrofits:
- yy. S3_5. All other lighting and non-lighting projects:
- zz. S3_6. {OPT OUT CODES}

DK Not sure

{IF S3_3=DK, TERMINATE: 104}

break

aaa. S4. Approximately, how many commercial and industrial lighting retrofit projects did you complete in the Northwest over the past 12 months?
(Enter your response as a whole number in the box below. Your best guess is fine.)

bbb. # retrofit projects completed: [RECORD NUMBER 0–9999]
DK

{IF S4=0, TERMINATE: 104}
{IF S4=DK, TERMINATE:301}

break

NOTE: COMMERCIAL AND INDUSTRIAL LIGHTING RETROFIT PRACTICES

These next questions are about the commercial and industrial lighting retrofit projects that you've personally worked on over the past 12 months.

break

DESIGN: SAME SCREEN Q1_1–Q10E
DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q1_1–Q1_8

Please indicate the approximate proportion of your commercial and industrial lighting retrofit projects completed over the past 12 months that included:

▪ (For each item that appears below, select the response that best describes your company's circumstances. Educated guesses are fine.)

-
- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

- Q1_1. Specification of light fixtures, lamps and/or ballasts
- Q1_2. Layout of light fixtures
- Q1_3. Computer modeling, lighting design or visualization of lighting
- Q1_4. Specification of lighting control equipment
- Q1_5. Layout of lighting controls
- Q1_6. Cost benefit analysis: payback, return on investment (ROI), lifecycle cost (LCC)
- Q1_7. Commissioning of lighting controls
- Q1_8. Planned or scheduled maintenance of lighting equipment

break

ccc. Q1oe. Please describe other services, if any, that your company provided as part of its commercial and industrial lighting retrofit projects during the past 12 months.

[OPEN END: L]

break

DESIGN: FLIP CODE DISPLAY 1–5

ddd. Q2. Approximately what proportion of your commercial and industrial lighting retrofit work completed over the past 12 months has been T12 change-outs (i.e., replacing T12 lighting systems with T8 or other technologies)?

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

break

DESIGN: FLIP CODE DISPLAY 1–5

eee. Q3. On what proportion of your commercial and industrial lighting retrofit projects do you have a discussion with your client about taking their lighting energy use to levels at or below a newly constructed building (i.e., to efficiency levels beyond those required by code)?

fff.

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

break

DESIGN: FLIP CODE DISPLAY 1–5

ggg. Q4. What proportion of your commercial and industrial lighting retrofit projects requires permits?

hhh.

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

break

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–5

iii. Q5. Please indicate how you determine the target light levels and lighting power densities in your commercial and industrial lighting retrofit projects.
(*Select all that apply.*)

- 1 State or Local Code
- 2 IESNA recommendations
- 3 Customer specifications
- 4 Previous personal experience
- 5 Utility energy efficiency program requirements
- 6 Other [OTHER: S]
- 7 None / Not applicable
- DK

break

Q6a. On what proportion of your commercial lighting retrofit projects do you calculate the lighting power density (LPD) of different options before selecting the final retrofit strategy?

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

break

Q6b. On what proportion of your commercial lighting retrofit projects do you calculate the annual energy use of different options before selecting the final retrofit strategy?

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

break

{IF Q5=1-6, ASK Q7; OTHERWISE GO TO Q8_1}

iii.

kkk. Q7. Do you measure light levels on site before AND after the installation of lighting systems to ensure light levels achieved are consistent with the original light level targets?

iii.

- 1 Only before
- 2 Only after
- 3 Before and after
- 4 Never
- 5 Depends on the project
- DK

break

{IF Q7=5, ASK Q7oe; OTHERWISE GO TO Q8}

Q7oe. Please describe why in certain situations you do take lighting levels and other times you do not. What factors contribute to that decision?

[OPEN END: L]

break

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q8_1–Q8_5

Please indicate the approximate proportion of your commercial and industrial lighting retrofit work completed over the past 12 months that involved:

▪ (For each item that appears below, select the response that best describes your company's circumstances. Educated guesses are fine.)

- - 1 None
 - 2 Less than half
 - 3 About half
 - 4 More than half
 - 5 All
- DK

- Q8_1. Standard layouts or "templates"
- Q8_2. Average room illuminance "Lumen method" calculations
- Q8_3. Computer models or designs (e.g., AGI32, Genesys)
- Q8_4. Measurements from a hand-held light meter
- Q8_5. Monitoring or other automated data collection
- Q8_6. Rules of thumb (tried and true methods)

break

{IF Q8_1=2–5, DK, ASK Q9; OTHERWISE GO TO Q10_1}

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–17

PROG. NOTE: BLOCK CODES 1–2, 3–5, 8–10 IN RANDOM ORDER

mmm. Q9. Which of the following design templates have you used on your commercial and industrial lighting projects?
(Select all that apply.)

- 1 Warehouse T5HO – Aisle lighting
 - 2 Warehouse T8 –Aisle lighting
 - 3 Open Office - High Performance-RT5 Style
 - 4 Open Office - High Performance-Pure-FX Style
 - 5 Open Office - Direct/Indirect
 - 6 Recessed 2 x 4 acrylic lens for open office.
 - 7 Private offices - both High Performance and Lens 2x4 option
 - 8 Open Warehouse - T5 Option
 - 9 Open warehouse - T8 Option
 - 10 Open warehouse - Sky Light/Daylight/Occupancy Sensor
 - 11 Retail - Small
 - 12 Freezer or special Warehouse application- Cold Storage/ LED High Bay
 - 13 Classrooms - Linear/Recessed/Controls
 - 14 Gymnasiums - Controls/Fixtures
 - 15 Parking Garages - LED and Linear Fluorescents
 - 16 Gas station - LED Retrofit
 - 17 Induction Lighting
 - 18 Other [OTHER: S]
 - 19 None, I have not used design templates
- DK

break

DESIGN: SAME SCREEN Q10_1–Q100E
DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q10_1–Q10_7

Please indicate the approximate proportion of your commercial and industrial lighting retrofit projects completed over the past 12 months that included:

▪ *(For each item that appears below, select the response that best describes your company's circumstances. Educated guesses are fine.)*

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

Q10_1. Emergency/egress lighting controls (i.e., shut off when unoccupied)

Q10_2. Automatic shut-off controls based on astronomical time clocks or vacancy sensors

Q10_3. LED Exit Signs

Q10_4. Dimming ballasts "tuned" to optimize illuminance level

Q10_5. Load shedding / demand response

Q10_6. Vacancy sensors with partial load control for corridors and stairways

Q10_7. Monitoring/logging of energy use via central control system

break

nnn. Q10oe. Please describe other lighting equipment, controls or strategies, if any, which were used for your commercial and industrial lighting retrofit projects during the past 12 months.

ooo.

[OPEN END: L]

break

The next few questions ask about the manufacturers and vendors you work with. Again, all survey responses are confidential.

ppp. Q11. Which lamp manufacturer(s) do you most commonly use on your lighting retrofit projects?

[OPEN END: L]

DK

break

qqq. Q12. Which lighting fixture/luminaire manufacturer(s) do you most commonly use on your lighting retrofit projects?

[OPEN END: L]

DK

break

rrr. Q13. Which lighting controls manufacturer(s) do you most commonly use on your lighting retrofit projects?

[OPEN END: L]
DK

break

sss. Q14. Which lighting distributor(s) or vendor(s) do you most commonly work with on your lighting retrofit projects?

[OPEN END: L]
DK

break

NOTE: LIGHTING RETROFIT PRACTICES FOR SPECIFIC BUILDING AND LOCATION TYPES

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–15

ttt. Q15. Please indicate the building or location types for which you've completed lighting retrofit projects over the past 12 months.

- 1 Offices
 - 2 Schools (K-12)
 - 3 Warehouses
 - 4 Grocery stores
 - 5 Assembly
 - 6 College/university
 - 7 Health services
 - 8 Hospital
 - 9 Multifamily residential
 - 10 Industrial
 - 11 Institutional
 - 12 Lodging
 - 13 Restaurant/bar
 - 14 Retail
 - 15 Exterior Lighting
 - 16 Other [OTHER: S]
- DK

break

DESIGN: SET VARIABLE

uuu. Q15_NUM. Number of building/location types R's company has completed any commercial or industrial lighting retrofit projects during the past 12 months.

[RECORD NUMBER 0–16]

{SET COUNT (Q15=1–16 SELECTED RESPONSES)}

break

{IF Q15=1, ASK Q16A, OTHERWISE GO TO FILTER BEFORE Q17A}

1 Q16A. How many OFFICE lighting retrofit projects did you complete over the past 12 months?
(If you are not sure of the exact number, please provide your best guess.)

[RECORD NUMBER 0-999]
DK

break

{IF Q16A>0, ASK Q16_1. OTHERWISE GO TO FILTER BEFORE Q17A}

DESIGN: SAME SCREEN Q16_1–Q16OE

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q16_1–Q18_8

Please indicate the approximate proportion of your OFFICE lighting retrofit projects completed over the past 12 months that included:

▪ (For each item that appears below, select the response that best describes your company's circumstances. Educated guesses are fine.)

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

Q16_1. Vacancy sensors for private offices (on/off)

Q16_2. Occupancy sensors with partial load control for open offices

Q16_3. Daylight controls

Q16_4. Personal control of dimming ballasts

Q16_5. Adjusting appropriate ballast factor

Q16_6. High performance lens kits

Q16_7. Smart plug strips

Q16_8. Task ambient (desk lamps)

break

vvv. Q16oe. Please describe other lighting equipment, controls or strategies, if any, which were used for your OFFICE lighting retrofit projects during the past 12 months.

[OPEN END: L]

break

{IF Q15=3, ASK Q17A, OTHERWISE GO TO FILTER BEFORE Q18A}

2 Q17A. How many WAREHOUSE lighting retrofit projects did you complete over the past 12 months?
(If you are not sure of the exact number, please provide your best guess.)

[RECORD NUMBER 0-999]
DK

break

{IF Q17A>0, ASK Q17_1. OTHERWISE GO TO FILTER BEFORE Q18A}

DESIGN: SAME SCREEN Q17_1–Q17OE

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q17_1–Q17_5

Please indicate the approximate proportion of your WAREHOUSE lighting retrofit projects completed over the past 12 months that included:

▪ (For each item that appears below, select the response that best describes your company's circumstances. Educated guesses are fine.)

▪

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

Q17_1. Skylights

Q17_2. Optimized fixture distribution (narrow-beam optics)

Q17_3. Integral Daylight and / or occupancy sensors per fixture

Q17_4. Optimized spacing of luminaires

Q17_5. Occupancy sensors with partial load control for aisles/racks

break

www. Q17oe. Please describe other lighting equipment, controls or strategies, if any, which were used for your WAREHOUSE lighting retrofit projects during the past 12 months.

[OPEN END: L]

break

{IF Q15=14, ASK Q18A, OTHERWISE GO TO FILTER BEFORE Q19A}

3 Q18A. How many RETAIL STORE lighting retrofit projects did you complete over the past 12 months?
(If you are not sure of the exact number, please provide your best guess.)

[RECORD NUMBER 0-999]

DK

break

{IF Q18A>0, ASK Q18_1. OTHERWISE GO TO FILTER BEFORE Q19A}

DESIGN: SAME SCREEN Q18_1–Q18OE

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q18_1–Q18_7

Please indicate the approximate proportion of your RETAIL STORE lighting retrofit projects completed over the past 12 months that included:

▪ (For each item that appears below, select the response that best describes your company's circumstances. Educated guesses are fine.)

▪

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

Q18_1. Skylights

Q18_2. LED Spotlights

- Q18_3. LEDs for display cases / refrigerator cases
- Q18_4. Proximity controls for display cases / refrigerator cases
- Q18_5. Daylight control for window displays
- Q18_6. "Adaptation compensation", i.e. reducing light levels when the store is open after dark
- Q18_7. Lighting shut off after hours for security

break

xxx. Q18oe. Please describe other lighting equipment, controls or strategies, if any, which were used for your RETAIL STORE lighting retrofit projects during the past 12 months.

[OPEN END: L]

break

{IF Q15=2, ASK Q19A, OTHERWISE GO TO FILTER BEFORE Q20A}

4 Q19A. How many SCHOOL lighting retrofit projects did you complete over the past 12 months?
(If you are not sure of the exact number, please provide your best guess.)

[RECORD NUMBER 0-999]
DK

break

{IF Q19A>0, ASK Q19_1. OTHERWISE GO TO FILTER BEFORE Q20A}

DESIGN: SAME SCREEN Q19_1–Q19OE
DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q19_1–Q19_5

Please indicate the approximate proportion of your SCHOOL lighting retrofit projects completed over the past 12 months that included:

▪ *(For each item that appears below, select the response that best describes your company's circumstances. Educated guesses are fine.)*

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

- Q19_1. Teacher wall lighting/control
- Q19_2. Vacancy sensors in classrooms
- Q19_3. AV/lighting controls
- Q19_4. Optimizing vertical illumination on walls
- Q19_5. Occupancy sensors with partial load control for aisles/racks

break

yyy. Q19oe. Please describe other lighting equipment, controls or strategies, if any, which were used for your SCHOOL lighting retrofit projects during the past 12 months.

[OPEN END: L]

break

{IF Q15=15, ASK Q20A, OTHERWISE GO TO Q21_1}

5 Q20A. How many EXTERIOR LIGHTING lighting retrofit projects did you complete over the past 12 months?

(If you are not sure of the exact number, please provide your best guess.)

[RECORD NUMBER 0-999]

DK

break

{IF Q20A>0, ASK Q20_1. OTHERWISE GO TO Q21_1}

DESIGN: SAME SCREEN Q20_1–Q20OE

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q20_1–Q20_3

Please indicate the approximate proportion of your EXTERIOR LIGHTING retrofit projects completed over the past 12 months that included:

▪ (For each item that appears below, select the response that best describes your company's circumstances. Educated guesses are fine.)

▪

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All

DK

Q20_1. Bi level controls using occupancy sensors or “part night” controls

Q20_2. Photocontrols

Q20_3. Timeclock controls

break

zzz. Q20oe. Please describe other lighting equipment, controls or strategies, if any, which were used for your EXTERIOR LIGHTING lighting retrofit projects during the past 12 months.

[OPEN END: L]

break

DESIGN: SAME SCREEN Q21_1–Q21OE

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q21_1–Q21_6

For each of the following issues, please indicate whether that issue is typically a major concern, a minor concern, or not a concern to your clients when making decisions about whether or not to specify or purchase lighting controls.

▪ (For each issue that appears below, select the response that best describes how your clients feel.)

- 1 Not a concern
- 2 A minor concern
- 3 A major concern

DK

Q21_1. Ongoing re-testing/re-tuning costs

Q21_2. Potential for equipment failures

Q21_3. Potential that users will override occupancy sensors.

Q21_4. Potential that users will override daylighting controls

Q21_5. Improvement in the visual environment

Q21_6. Degradation of the visual environment

break

aaaa. Q21oe. Please describe any other concerns or considerations your clients share regarding the installation of lighting controls.

[OPEN END: L]

break

DESIGN: FLIP CODE DISPLAY 1–4

bbbb. Q22. How often do the lighting controls installed for your commercial and industrial lighting retrofit projects differ from the original specification?

- 1 Never
- 2 Occasionally
- 3 Frequently
- 4 Always
- DK

break

cccc. Q22oe. Please describe the most common reasons lighting controls installed for your commercial and industrial lighting retrofit projects have differed from the original specification.

[OPEN END: L]

break

```

{IF Q15_NUM=1-3 & Q15=1, SET Q23=1}
{IF Q15_NUM=1-3 & Q15=2, SET Q23=2}
{IF Q15_NUM=1-3 & Q15=3, SET Q23=3}
{IF Q15_NUM=1-3 & Q15=4, SET Q23=4}
{IF Q15_NUM=1-3 & Q15=5, SET Q23=5}
{IF Q15_NUM=1-3 & Q15=6, SET Q23=6}
{IF Q15_NUM=1-3 & Q15=7, SET Q23=7}
{IF Q15_NUM=1-3 & Q15=8, SET Q23=8}
{IF Q15_NUM=1-3 & Q15=9, SET Q23=9}
{IF Q15_NUM=1-3 & Q15=10, SET Q23=10}
{IF Q15_NUM=1-3 & Q15=11, SET Q23=11}
{IF Q15_NUM=1-3 & Q15=12, SET Q23=12}
{IF Q15_NUM=1-3 & Q15=13, SET Q23=13}
{IF Q15_NUM=1-3 & Q15=14, SET Q23=14}
{IF Q15_NUM=1-3 & Q15=15, SET Q23=15}
{IF Q15_NUM=1-3 & Q15=16, SET Q23=16}
{IF Q15_NUM=4-16, ASK Q23; OTHERWISE GO TO INTRO8}

```

DESIGN: MULTI BINARY

PROG. NOTE: SHOW CODES IN THE SAME ORDER USED IN Q15

dddd. Q23. Please indicate the three building or location types that you most commonly work with for your lighting retrofit projects.
(Select up to 3 building/location types from the list below.)

- 1 {SHOW IF Q15=1} Offices
- 2 {SHOW IF Q15=2} Schools (K-12)
- 3 {SHOW IF Q15=3} Warehouses
- 4 {SHOW IF Q15=4} Grocery stores
- 5 {SHOW IF Q15=5} Assembly
- 6 {SHOW IF Q15=6} College/university
- 7 {SHOW IF Q15=7} Health services
- 8 {SHOW IF Q15=8} Hospital
- 9 {SHOW IF Q15=9} Multi-family residential
- 10 {SHOW IF Q15=10} Industrial
- 11 {SHOW IF Q15=11} Institutional
- 12 {SHOW IF Q15=12} Lodging
- 13 {SHOW IF Q15=13} Restaurant/bar
- 14 {SHOW IF Q15=14} Retail
- 15 {SHOW IF Q15=15} Exterior Lighting
- 16 {SHOW IF Q15=16} (RESTORE: Q15=16)
- 17 Another type of building/location; list here: [OTHER: S]

DK

break

DESIGN: ATTRIBUTES

eeee. BLOCK_A. Building types to be evaluated.

- 1 {SHOW IF Q23=1} Offices
- 2 {SHOW IF Q23=2} Schools (K-12)
- 3 {SHOW IF Q23=3} Warehouses
- 4 {SHOW IF Q23=4} Grocery stores
- 5 {SHOW IF Q23=5} Assembly
- 6 {SHOW IF Q23=6} College/university
- 7 {SHOW IF Q23=7} Health services

- 8 {SHOW IF Q23=8} Hospital
 - 9 {SHOW IF Q23=9} Multi-family residential
 - 10 {SHOW IF Q23=10} Industrial
 - 11 {SHOW IF Q23=11} Institutional
 - 12 {SHOW IF Q23=12} Lodging
 - 13 {SHOW IF Q23=13} Restaurant/bar
 - 14 {SHOW IF Q23=14} Retail
 - 15 {SHOW IF Q23=15} Exterior Lighting
 - 14 {SHOW IF Q23=16} (RESTORE: Q23=16)
 - 15 {SHOW IF Q23=17} (RESTORE: Q23=17)
-
- break

DESIGN: LOOP=Q24A_[X]-Q24I_[X]
X=1-15

PROG. NOTE: Q24A-Q24I RESPONSES SHOULD SUM TO 100%, IF RESPONSES DO NOT EQUAL 100% PLEASE SHOW NOTE: "PLEASE SUMM YOUR RESPONSES TO EQUALL 100%."
PLEASE MAKE DK A RADIO BUTTON THAT CAN NOT BE CHOSE IN CONBINATION WITH ANY OTHER Q2QA-Q24I RESPONSE.

Please indicate the approximate distribution of lamp types for the new fixtures and lamp and ballast retrofit installed in your (RESTORE: BLOCK_A=[X]) lighting retrofit projects completed during the past 12 months.

[RECORD NUMBER 0-100]%
Q24a_[X]. T8:
ffff. Q24b_[X]. High performance T8:
gggg. Q24c_[X]. Regular T5:
hhhh. Q24d_[X]. T5HO (high output):
iiii. Q24e_[X]. CFL:
jjjj. Q24f_[X]. Incandescent:
kkkk. Q24g_[X]. HID:
llll. Q24h_[X]. LED:
mmmm. Q24i_[X]. Other:
DK Not sure

break

NOTE: EXPERIENCE WITH UTILITY COMMERCIAL AND INDUSTRIAL LIGHTING RETROFIT PROGRAMS

nnnn. INTRO8. These next questions are about any experiences you may have had with utility lighting programs.

break

DESIGN: FLIP CODE DISPLAY 1-5

oooo. Q27. Please indicate the approximate proportion of your commercial and industrial lighting retrofit projects completed during the past 12 months that involved a utility's commercial and industrial lighting incentive program?

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All
- DK

break

{IF Q27=2-5, DK, ASK Q28, OTHERWISE GO TO Q34.}

pppp. Q28. Which utilities have you worked with?

[OPEN END: L]

break

qqqq. Q29. Have you worked with one or more utility lighting programs that provide escalating incentive rate "tiers" or any other escalating incentives designed for deeper savings?

- 1 Yes
- 2 No
- DK

break

{IF Q29=1, ASK Q30, OTHERWISE GO TO Q31}

DESIGN: FLIP CODE DISPLAY 1-5

rrrr. Q30. Overall, has your experience working with utility lighting programs providing escalating incentive rate “tiers” or any other escalating incentives designed for deeper savings been...?
(Select one.)

- 1 Very negative
- 2 Somewhat negative
- 3 Neither positive nor negative
- 4 Somewhat positive
- 5 Very positive
- DK

break

{IF Q30=1-5, ASK Q30OE, OTHERWISE GO TO Q31}

ssss. Q30OE. Please describe the reasons your experiences with utility lighting programs providing escalating incentive rate “tiers” or any other escalating incentives designed for deeper savings have been (RESTORE: Q30)?
(Enter your response in the box below. Please be as specific as possible.)

[OPEN END: L]

break

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–7

tttt. Q31. Which of the following are the main reasons your clients typically decide to opt for deeper savings on their commercial and industrial lighting retrofit projects?
(Please select all that apply.)

- 1 Reduced life-cycle cost
- 2 Financial incentives
- 3 Reduced maintenance cost
- 4 Improved quality of the visual environment
- 5 Best practices in lighting design (e.g., task ambient lighting, inclusion of controls)
- 6 Good citizenship
- 7 Improved productivity
- 8 Other [OTHER: S]
- 9 Can't say – I've never had a client opt for deeper savings
- DK

break

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–8

uuuu. Q32. Which of the following are the main reasons your clients typically decide to NOT to opt for deeper savings on their commercial and industrial lighting retrofit projects? (Select all that apply.)

- 1 Added capital cost
- 2 Added design cost
- 3 Added maintenance cost
- 4 Added project complexity
- 5 Added disruption
- 6 Potential for project delays
- 7 Uncertainty of performance of equipment
- 8 Reduced quality of the visual environment
- 9 Other [OTHER: S]
- 10 Can't say – I've always had clients opt for deeper savings

DK

break

vvvv. Q33. In your experience, do utility lighting programs that provide escalating incentive rate “tiers” or any other escalating incentives designed for deeper savings motivate your clients to opt for deeper savings on their commercial and industrial lighting retrofit projects?

- 1 Yes
- 2 No

DK

break

www. Q34. What proportion of lighting retrofit projects you are involved in are pursued primarily to save energy or reduce power costs?

- 1 None
- 2 Less than half
- 3 About half
- 4 More than half
- 5 All

DK

break

xxxx. Q35. Have you worked with one or more utilities that offer a “comprehensive” lighting program that delivers lighting that meets current IES light level recommendations for the space type, meets or beats lighting new construction LPD code requirements (best practices), integrates lighting controls, and takes into consideration all of the lighting in the space?

- 1 Yes
- 2 No

DK

break

{IF Q35=1, ASK Q36, OTHERWISE GO TO Q37}

DESIGN: FLIP CODE DISPLAY 1-5

yyyy. Q36. Overall, has your experience working with utilities' "comprehensive" lighting programs been...?
(Select one.)

- 1 Very negative
- 2 Somewhat negative
- 3 Neither positive nor negative
- 4 Somewhat positive
- 5 Very positive
- DK

break

{IF Q36=1-5, ASK Q36OE, OTHERWISE GO TO Q37}

zzzz. Q36OE. Please describe the reasons your experiences with utilities' comprehensive lighting programs have been (RESTORE: Q36)?
(Enter your response in the box below. Please be as specific as possible.)

[OPEN END: L]

break

NOTE: TRENDS AND FUTURE DEVELOPMENTS FOR LIGHTING RETROFIT PROGRAMS

aaaaa. INTRO4. These next questions are about lighting industry trends and new developments.

break

bbbbb. Q37. How has your lighting business changed in the past three years as a result of developments in lighting industry and lighting technologies?
(Enter your response in the box below. Please be as specific as possible.)

[OPEN END: L]

break

ccccc. Q38. How do you think your lighting business is likely to change over the next three years in response to changes in lighting industry and lighting technologies?
(Enter your response in the box below. Please be as specific as possible.)

[OPEN END: L]

break

dddd. Q39. How do you anticipate the federally mandated phase-out of some T-12 lamps in mid-2012 and T-12 ballasts in 2013 will impact your business going forward?
(Enter your response in the box below. Please be as specific as possible.)

[OPEN END: L]

break

eeee. Q40. How do you expect businesses in your field to modify their activities in response to the T12 phase-out?
(Enter your response in the box below. Please be as specific as possible.)

[OPEN END: L]

break

NOTE: EDUCATION AND TRAINING

These next questions are about your sources for information and training about new lighting technologies.

break

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–9

ffff. Q41_1. What sources do you typically use to keep up to date on new lighting technologies and design trends?
(Select all that apply.)

- 1 Professional organizations
 - 2 Updates from manufacturers
 - 3 Trade publications
 - 4 Trade shows (e.g. Lightfair)
 - 5 Lighting Design Lab
 - 6 Utility websites
 - 7 Utility sponsored training
 - 8 Manufacturer websites
 - 9 Advanced lighting guidelines (ALG)/ALG online
 - 10 Northwest Trade Ally Network website
 - 11 Other [OTHER: S]
- DK

break

{IF Q41_1=1, ASK Q42, OTHERWISE GO TO FILTER BEFORE Q44}

ggggg. Q42. Please list any professional organizations that help keep you up to date on new lighting technologies and design trends.
(Enter your response in the box below. Please be as specific as possible.)

[OPEN END: L]

break

DESIGN: MULTI BINARY

hhhhh.

iiii. Q43. For these professional organizations, do you typically attend...?
(Select all that apply.)

- 1 Local meetings
 - 2 Regional events
 - 3 National events
 - 4 None of these
- DK

break

{IF Q41_1=2, ASK Q44, OTHERWISE GO TO FILTER BEFORE Q45}

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–4

jjjj. Q44. How do you typically receive updates from lighting manufacturers?
(*Select all that apply.*)

- 1 Emails
- 2 Newsletters
- 3 Training sessions
- 4 Manufacturer website
- 5 Other [OTHER: S]
- DK

break

{IF Q41_1=3, ASK Q45, OTHERWISE GO TO FILTER BEFORE Q46}

kkkkk. Q45. Please list any trade publications that help keep you up to date on new lighting technologies and design trends.
(*Enter your response in the box below. Please be as specific as possible.*)

[OPEN END: L]

break

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–11

{IF Q41_1=4, ASK Q46, OTHERWISE GO TO Q47}

lllll. Q46. What organizations do you or your company currently maintain a membership?
(*Select all that apply.*)

- 1. Northwest Trade Ally Network
- 2. Energy Trust of Oregon Trade Ally Network
- 3. Other Northwest Utility's trade ally networks (Please specify)
- 4. Local or national chapters of the National Electrical Contractors association (NECA)
- 5. Local or national chapters of the National Association of Electrical Distributors (NAED)
- 6. Northwest Energy Efficiency Council (NEEC)
- 7. Local or national chapters of International Brotherhood of Electrical Workers (IBEW)
- 8. Local or national chapters of Independent Electrical Contractors (IEC)
- 9. Local or national chapter of Independent Electric Distributors (IED)
- 10. Illuminating Engineering Society of North America "MIES" (member IES)
- 11. Certified Energy Manager
- 12. Other [OTHER: S]

break

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–5

Q47. Which of the following training courses have you completed?
(Select all that apply.)

- 1 One or more courses run by a manufacturer
 - 2 One or more courses run by the Northwest Trade Ally Network
 - 3 One or more courses run by Lighting Design Lab
 - 4 One or more courses run by your local utility
 - 5 One or more IES courses (e.g., ED50, ED100, ED150)
 - 6 Other [OTHER: S]
 - 7 Not applicable – I haven't taken any training courses or certifications
- DK

break

DESIGN: MULTI BINARY, RANDOMIZE CODES 1–5

Q48. Which of the following certifications have you completed?
(Select all that apply.)

- 1 Licensed Electrician
 - 2 Passed the NCQLP "Lighting Certified" LC exam
 - 3 Registered Architect
 - 4 Professional Engineer
 - 5 Member of IALD
 - 6 BS or MS degree specializing in lighting
 - 7 Other [OTHER: S]
- DK

break

DESIGN: SAME SCREEN Q49_1–Q49_7

DESIGN: ROW GRID, RANDOMIZE QUESTIONS Q49_1–Q49_7

Q49. Have you completed training on:

- 1 Yes
 - 2 No
- DK

Q49_1 Emergency/egress lighting controls (i.e., shut off when unoccupied):

Q49_2. Automatic shut-off controls based on astronomical time clocks or vacancy sensors:

Q49_3. LED Exit Signs:

Q49_4. Dimming ballasts "tuned" to optimize illuminance level:

Q49_5. Load shedding / demand response:

Q49_6. Vacancy sensors with partial load control for corridors and stairways:

Q49_7. Monitoring/logging of energy use via central control system:

break

mmmmm. Q50. What services or information could the utilities or NEEA provide to help you to better market energy efficient lighting equipment projects?
(Enter your response in the box below. Please be as specific as possible.)

[OPEN END: L]

break

nnnnn. Q51. What other types of training programs would you like for the utilities or NEEA to offer in the future?
(Enter your response in the box below. Please be as specific as possible.)

[OPEN END: L]

break

NOTE: FIRMOGRAPHICS

These last few questions are for classification purposes only.

Q52. How many office or business locations does your company operate in the Northwest (Washington, Oregon, Idaho and Montana)?
(If you are not sure of the exact number, please provide your best guess.)

[RECORD NUMBER 1-9999]
DK

break

Q53. How many full-time employees work at your specific business location?
(If you are not sure of the exact number, please provide your best guess.)

[RECORD NUMBER 1-9999]
DK

break

{IF Q53>1, ASK Q53A, OTHERWISE GO TO FILTER BEFORE Q54}

Q53A. How many full-time employees at your business location work on lighting projects?
(If you are not sure of the exact number, please provide your best guess.)

[RECORD NUMBER 1-9999]
DK

break

{IF Q52>1, ASK Q54, OTHERWISE GO TO Q55A_1}

Q54. Approximately, how many full-time employees in total work at all your company's locations in the Northwest (Washington, Oregon, Idaho and Montana)?
(If you are not sure of the exact number, please provide your best guess.)

[RECORD NUMBER 1-9999]
DK

break

DESIGN: SAME SCREEN Q55A_1

DESIGN: DROP DOWN

PROG. NOTE: SHOW Q55A_1

ooooo. Q55A_1. Please list the top 5 Northwest cities (within Washington, Oregon, Idaho or Montana) where your company performs commercial and industrial lighting retrofits.
(Please list up to five cities and their states.)

[RECORD CITY, STATE]
DK

break

DESIGN: SUM LE 100%

ppppp.

qqqqq. Considering all of the work your company does (including lighting and non-lighting projects), please

rrrrr. indicate the approximate percentage of your company's work in the Northwest (Washington, Oregon,

sssss. Idaho and Montana) that involves:

- *Enter your responses as whole numbers in each of the boxes below. Educated guesses are fine.)*

[RECORD NUMBER 0–100]%

ttttt.

Q56_1. Commercial lighting retrofits (e.g., office, schools, retail, warehouse, etc.) _____%

Q56_2. Industrial lighting retrofits (e.g., manufacturing) _____%

Q56_3. Residential lighting retrofits _____%

Q56_4. All other lighting and non-lighting projects

uuuuu. Q56_5. {OPT OUT CODES}

DK Not sure

break

This concludes the NEEA commercial and industrial lighting retrofit survey CCLI survey.

Your participation in this survey has been very helpful. As I mentioned earlier, we typically only summarize individual responses in aggregate with those we receive from other respondents, but sometimes it can be helpful for NEEA to look at feedback from individual trade allies. May we share your name and your individual responses to this survey with NEEA?

1 Yes

2 No

DK

break

vvvvv.

wwwww. Q57. Would you be interested in being participating in future NEEA studies?

1 Yes

2 No

break

{IF Q57=1, ASK RFNAME; OTHERWISE GO TO SURVEY CLOSE}

DESIGN: SAME SCREEN RFNAME–RECEMAIL

NOTE: ELECTRONIC COMMENT FORM; ALL COMMENT FORM QUESTIONS NOT FORCED

Please record your name, phone number and email address where you would like NEEA to reach you. Your information will not be used for any other purpose.

- *(Type in the appropriate information in each of the boxes below—one answer per box.)*

xxxxx. RFNAME. First Name:

yyyyy.

[OPEN END: S]

break

zzzzz.

rlname. Last Name:

[OPEN END: S]

break

aaaaaa.

bbbbbb.

COMNAME.

Company Name:

[OPEN END: S]

break

ccccc.

dddddd.

RECPHONE.

Telephone Number:

[OPEN END: S]

break

RECEMAIL.

Email Address:

[OPEN END: S]

break

]

NOTE: SURVEY CLOSE

Thanks for taking the time to participate in our survey. Your responses will help inform the development of future regional lighting retrofit program offerings.

break

10. APPENDIX D: TOPLINE SUMMARY OF UTILITY SURVEY RESULTS

This section reproduces a memo from Market Strategies International (MSI) outlining a summary of the results from the utility program manager survey.

MEMO

To Rita Siong, NEEA
Elaine Miller, NEEA
David Douglass, H-M-G

From Ron Newheiser, Market Strategies

Date July 20, 2012

Re Topline Summary: 2012 NEEA Comprehensive Commercial Lighting Initiative (CCLI) Utilities Baseline Survey (revised)

Overview and Objectives

- The objectives of the 2012 NEEA CCLI Utilities Baseline Survey are to:
 - Establish baseline measures for the Comprehensive Commercial Lighting Initiative (CCLI).
 - Identify the program offerings from Northwest utilities related to commercial lighting
 - Identify barriers to establishing comprehensive commercial lighting programs with utility customers
 - Identify the impact of the forthcoming Federal standards for linear fluorescent lamps and EPACT legislation on utility programs and plans for the future.

Methodology and Respondent Profile

- Invitations to complete the CCLI Utilities survey online were sent via email to 79 utility lighting program managers in the Northwest who are involved in developing, implementing or coordinating utility's lighting retrofit programs for commercial customers.
 - 40 individuals from 38 different organizations completed the self-administered survey, which took approximately 30 minutes on average.
 - 23 of 40 (58%) respondents work for "Option 1 public utility customers of BPA."
 - Among the 23 BPA customer respondents, 10 report making modifications to BPA's standard program to meet their own program objectives.
 - 17 of 40 (43%) are Lighting Work Group participants.
 - 6 of 40 are NEEA Comprehensive Commercial Lighting Pilot participants.
-

Current Lighting Retrofit Programs

- Respondents were first asked about their **standard lighting retrofit** program incentives and requirements.
- Current standard lighting retrofit incentives:
 - 36 of 40 (90%) offer *fixed financial incentives based on equipment installed or new control devices*.
 - Among the 36 who offer fixed financial incentives, incentives are structured to pay higher fixed incentive rates for *installation of lighting controls* (29 of 34, 85%; 2 did not know), *installation of low wattage lamps or low ballast factor ballasts* (23 of 34, 68%), *reduction in the number of lamps by de-lamping currently installed fixtures* (15 of 34, 44%), *reduction in the number of fixtures when upgrading multiple fixtures* (10 of 34, 29%).
 - 9 of 31 (29%; 5 did not know) indicate that *task lighting* is eligible for incentives as part of standard lighting retrofit programs. (Among those who do not, none plan to offer this in 2012.)
 - 3 of 30 (10%; 6 did not know) indicate *smart plug strips* (with occupancy sensors) are eligible for incentives as part of standard lighting retrofit programs, while 1 plans to offer this in 2012, and 6 indicate this is currently offered via other programs.
 - 12 of 40 (30%) offer *per kWh incentives from estimated reductions in lighting energy use*.
 - 1 of 40 (2.5%) report offering *incentives specifically for lighting design work*.
- Performance requirements for standard lighting retrofit programs:
 - 26 of 40 (65%) require projects to *meet certain minimum savings versus baseline*, while 13 of 40 (33%) require projects to *meet or exceed local energy code*.
 - Fewer require projects to meet *IES illuminance requirements or other light level requirements* (5 of 40, 13%), *reduce energy use below a certain kWh or kW per square foot threshold* (4 of 40, 10%), *include basic controls* (4 of 40, 10%), or *address all opportunities of certain types (e.g., exit signs, T-12s, etc.)* (4 of 40, 10%).
- 7 of 38 (18%, excluding 2 who did not know) offer *escalating incentives or rate tiers designed to promote deeper savings* as part of their standard lighting retrofit programs.
- 35 of 38 (92%, excluding 2 who did not know) report that the *kWh savings from the retrofit are calculated relative to existing conditions of the building* for their standard lighting retrofit programs.
- Nearly all (39 of 40, 98%) report that their standard lighting retrofit programs include incentives for the installation of lighting controls.
 - Most (23 of 36, 59% excluding 3 who did not know) indicate that all lighting control types receive the same fixed incentive or percentage savings, while 13 of 36 (36% excluding 3 who did not know) indicate incentives vary by control type.
 - Nearly all offer incentives for *occupancy sensors* (38 of 38, 100% excluding 1 who did not know) and *photocontrols* (34 of 36, 94% excluding 3 who did not know).
 - For the remaining control types listed, approximately one-third to one-half of respondents did not know whether they offered the specified incentives as part of their standard programs. Among these control types, incentives for *centralized (“tuned”) dimming controls* (22 of 27, 81% excluding 12 who did not know), *time sweep controls* (16 of 20, 80% excluding 19 who did not know), *egress lighting shut-off controls* (15 of 22, 68% excluding 17 who did not know), and *addressable controls* (15 of 23, 65% excluding 16 who did not know) received the most mentions.
 - Most indicated that lighting controls are not mandatory for standard lighting retrofit programs.
- 33 of 38 (87% excluding 2 who did not know) report that they offer custom lighting retrofit programs.
- Current custom lighting retrofit incentives:

- 24 of 33 (73%) offer *per kWh incentives calculated from lighting energy use reductions*.
 - Among the 24 who offer per kWh or per kW incentives, 4 of 19 (21% excluding 5 who did not know) indicate that the per kWh or per kW cost is greater in the custom program compared with the standard incentive program, 7 (37%) indicate it is less, and 8 (42%) indicate it's the same.
- 10 of 33 (30%) offer *fixed financial incentives based on equipment installed or new control devices*.
 - Among the 10 who offer fixed financial incentives as part of their custom programs, 2 indicate that *task lighting* is eligible for incentives as part of custom lighting retrofit programs. (4 did not know.) Among those who do not, none plan to offer this in 2012.
 - None offer incentives for *smart plug strips* (with occupancy sensors) incentives as part of custom lighting retrofit programs, and none plan to offer this. 2 indicate this is currently offered via other programs.
- 2 of 33 (6%) offer *incentives specifically for lighting design work*.
- Performance requirements for custom lighting retrofit programs:
 - 15 of 30 (50%, excluding 3 who did not know) require projects to *meet certain minimum savings versus baseline*, while 9 of 30 (30%) require projects to *meet or exceed local energy code*.
 - Fewer require projects to *reduce energy use below a certain kWh or kW per square foot threshold* (3 of 30, 10% excluding 3 who did not know), *address all opportunities of certain types (e.g., exit signs, T-12s, etc.)* (3 of 30, 10%), *meet IES illuminance requirements or other light level requirements* (2 of 30, 7%), or *include basic controls* (2 of 30, 7%).
- 3 of 32 (9% excluding 1 who did not know) offer *escalating incentives or rate tiers designed to promote deeper savings* for their custom lighting retrofit programs.
- 32 of 33 (97%) report that the *kWh savings from the retrofit are calculated relative to existing conditions of the building* for their custom lighting retrofit programs.
- 23 of 33 (70% excluding 1 who did not know) report that their custom lighting retrofit programs include incentives for the *installation of lighting controls*.
 - One-half (10 of 20, 50% excluding 3 who did not know) indicate that all lighting control types receive the *same* fixed incentive or percentage savings, while the other half (50%) indicate incentives *vary by control type*.
 - Most offer incentives for *occupancy sensors* (17 of 19, 89% excluding 1 did not know), *photocontrols* (16 of 19, 84% excluding 1 who did not know), *centralized ("tuned") dimming controls* (15 of 16, 94% excluding 4 who did not know), *addressable controls* (14 of 16, 88% excluding 4 who did not know), *astronomical time clocks* (12 of 16, 75% excluding 4 who did not know), and *egress lighting shut-off controls* (11 of 14, 79% excluding 6 who did not know).
 - For the most part, these incentives are calculated rather than fixed.
 - Most indicated that lighting controls are not mandatory for custom lighting retrofit programs.

Training, Technical, and Marketing Support Offered to Trade Allies

- 24 of 38 (63% excluding 2 who did not know) report that they currently offer training and/or technical services to electrical contractors regarding lighting upgrades and retrofits.
- Among those offering training or technical services:
 - 9 of 19 (47% excluding 5 who did not know) offer training/services on the design and specification of controls systems
 - 7 of 22 (32% excluding 2 who did not know) offer training/services on lighting quality criteria such as illuminance, uniformity and color rendering
 - 7 of 22 (32%) offer training/services on lighting design calculations and/or software.

- 2 of 19 (11% excluding 5 who did not know) offer training/services on installation and commission of control systems.
- None offer training or services for lighting design templates.
- 12 of 38 (32% excluding 2 who did not know) offer design review for at least some of their projects beyond that from Lighting Design Labs. 3 of these 12 indicate this is mandatory for some (1) or all (2) projects.
- 12 of 40 (30%) offer marketing support to trade allies (e.g., top performing recognition, awards, PR, etc.).
- Nearly all (37 of 39, 95% excluding 1 who did not know) do not require customers to work with a utility approved contractor. 12 of 39 (31%) provide a list of approved contractors, however.

Future Lighting Retrofit Programs

- Respondents were asked several questions about the impact of the forthcoming Federal standards for linear fluorescent lamps. The EPACT legislation becomes effective July 14, 2012, and raises the minimum efficacy of linear fluorescent lamps. Almost all current T-12 lamps are non-compliant with this new standard, and therefore cannot be sold once existing stocks run out.
 - 24 of 34 (71% excluding 6 who did not know) report that 50% or more of their current program savings is related to T-12 change-outs which are being phased out in 2012.
 - Among those that could estimate the impact of the T-12 phase out, 9 of 24 (38% excluding 16 who did not know) estimate that they would lose 50% or more of their program savings due to program or baseline changes resulting from the forthcoming Federal standards if their utility program is not modified.
 - 23 of 40 (58%) utilities did not know what changes they were going to make to their T-12 incentives. 5 of 40 (13%) report they will *stop the T-12 incentive entirely*, while 12 of 40 (30%) plan to *decrease the incentive to a much lower level*.
 - Among the 17 planning to reduce or discontinue their T-12 incentives, 2 plan to do so in October 2012, 1 in December 2012, 3 in January 2013, 6 in April 2013, and 1 in October 2013. 4 did not know when they will implement changes.
- 10 of 30 (33% excluding 10 who did not know) indicate their utility has other specific plans for future development of its commercial lighting programs.
 - Among these ten, most plan to *develop a new program internally or with help from consultants* (6) and/or *collaborate with another utility or agency to develop a program* (6).
 - 2 named NEEA and 3 named BPA as collaboration partners.
 - None indicates that they are planning to *adopt a whole lighting program from another utility or agency*.

- Respondents were asked to indicate how likely they were to offer various elements as part of their commercial lighting retrofit programs three years from now. Results are summarized in Table 1 on the following page:

Table 1: Likelihood that utility will offer program elements in its commercial lighting retrofit programs three years from now

<i>Base: 40</i>	Currently offer	Definitely will	Probably will	Total: Currently offer or will	Don't know
Incentives for the installation of lighting controls	40%	18%	25%	83%	15%
A "custom" lighting retrofit program	28%	13%	33%	73%	20%
Fixed financial incentives based on 1:1 equipment change-outs	23%	10%	30%	63%	25%
Offer additional incentives to encourage customers to achieve deeper lighting savings in their buildings	10%	8%	40%	58%	18%
Per-kWh incentives (calculated from lighting power reductions multiplied by lamp hours of use per year)	25%	8%	23%	55%	28%
Training and/or technical services to electrical contractors regarding lighting upgrades and retrofits	18%	3%	28%	48%	25%
Owner education / marketing on quality lighting projects	10%	5%	28%	43%	30%
Escalating incentive rate "tiers" based on how much energy is being saved, or on lighting power densities	10%	5%	13%	28%	35%
Incentives specifically for lighting design work	3%	0%	15%	18%	40%

Barriers To Implementation Of New Lighting Programs

- Respondents were asked how important it will be to address various barriers that trade allies and commercial customers may need to overcome to implement future lighting retrofits. Results are summarized in Table 2 below.

Table 2: Importance of addressing various barriers that trade allies and commercial customers may need to overcome to implement future lighting retrofits

	Extremely important	Very Important	Total: Extremely or Very Important	Don't know
<i>Base: 40</i>				
Lack of trade ally skills required to propose, sell, and deliver a well-designed lighting retrofit project	33%	35%	68%	8%
Additional up-front cost to the customer of the project, thus hard to sell	20%	48%	68%	8%
Lack of trade ally expertise in fine-tuning lighting controls to optimize savings	23%	40%	63%	8%
Lack of customer awareness of the added benefits of high quality, best practice lighting design (e.g., worker retention, productivity improvement)	15%	45%	60%	8%
Lack of customer motivation to pursue deeper savings due to the longer payback time	20%	38%	58%	10%
The continued availability of simpler utility programs that the customer or trade ally may find easier to take part in	18%	33%	50%	8%
Additional trade ally labor required to design deeper lighting retrofit projects, compared with 1:1 equipment replacement projects	15%	33%	48%	13%
Customer distrust about the performance of lighting control systems	5%	38%	43%	10%
Additional paperwork for trade allies caused by more complex projects	13%	30%	43%	8%
Additional customer labor required to design lighting retrofit projects, compared with 1:1 equipment replacement projects	10%	30%	40%	15%
Potential project delays caused by the increased complexity of the projects	13%	25%	38%	10%
Concerns about degradation of visual environment with a retrofit project that attempts deeper savings	8%	30%	38%	10%
Confusion caused by utilities offering multiple lighting incentive programs to each customer	10%	20%	30%	13%
Disruption to the customer's business activities caused by the need to replace fixtures and/or add controls	5%	23%	28%	10%
Concerns about on-going maintenance problems and costs due to equipment failure, and trade ally call backs	3%	25%	28%	15%

Future Utility Actions To Help Increase Lighting Energy Savings In The Northwest

- Respondents were asked how likely they would be to consider taking various actions to help increase lighting energy savings in the Northwest. Responses are summarized in Table 3 below:

Table 3: Likelihood utility will consider taking various actions to help increase lighting energy savings in the Northwest

	Have already done this	Would definitely consider	Total: Already doing or would definitely consider	Don't know
<i>Base: 40</i>				
Provide increased incentives for lighting upgrades that take a comprehensive, redesign approach and offer deeper savings.	10%	23%	33%	10%
Partner with the rest of the region's utilities in delivering comprehensive lighting training.	13%	20%	33%	13%
Partner with the rest of the region's utilities in the development of comprehensive lighting marketing tools and trainings for trade allies.	0%	30%	30%	18%
Offer tiered incentives based on overall kWh reductions relative to code.	10%	15%	25%	18%
Partner with the rest of the region's utilities in the development of comprehensive lighting marketing tools to help educate owners on the benefits of high quality, energy efficient lighting.	0%	20%	20%	13%
Assist with locating willing "first adopter" contractors and customers for comprehensive lighting solution pilots.	5%	13%	18%	10%
Increase program requirements for advanced technologies to help move the market toward more comprehensive lighting projects.	3%	15%	18%	13%
Increase program requirements for evidence of optimized lighting designs to help move the market toward more comprehensive lighting projects.	3%	15%	18%	15%
Explore financial assistance for trainings and certifications for contractors.	0%	10%	10%	10%
Participate in group "buy-downs" from manufacturers of target technology to increase adoption in NW.	0%	8%	8%	28%

NEEA's Role

- Finally, respondents were asked which specified roles and strategies NEEA should pursue to best help utilities achieve their commercial lighting retrofit goals. Results are provided in Table 4 below.

Table 4: Roles and strategies NEEA should pursue to best help utilities achieve their commercial lighting retrofit goals

	Percent "Yes"
	Base: 40
Target, train and work with regional distributors and manufacturer representatives to help deliver more comprehensive lighting retrofit projects	63%
Develop regional marketing tools to educate customers on the benefits of deeper, more comprehensive lighting retrofits	60%
Support the demonstration of new technologies	53%
Coordinate the sharing of tools and resources between utilities to help the market process more complex lighting retrofit projects	50%
Improve existing tools for lighting redesign so they are more applicable to the retrofit market rather than new construction projects	48%
Provide regional "design" services for trade allies	45%
Develop a regional "hub" of resources for trade allies / electrical contractors serving utility programs	45%
Develop a regional lighting certification program that works to improve the skill sets of trade allies / electrical contractors	43%
Develop a new program to incentivize deeper lighting retrofits	35%
Improve existing lighting calculator tools to include more accurate assessments of savings from controls	33%
Develop regional marketing tools to help "top performing" and high quality trade allies differentiate their abilities in the marketplace	23%
Don't know	2%

Conclusions

Most commercial lighting retrofit program offerings exclude complex incentive structures which would be more difficult to implement and calculate. Nearly all utilities report that their current standard commercial lighting retrofit programs offer fixed financial incentives for equipment installations or controls. Per kWh incentives for reduction in lighting energy use are much more common among custom program offerings (73%) versus standard program offerings (30%). Among both standard and custom programs that offer incentives for lighting controls, most provide the same fixed incentives for all lighting control types. For most standard and custom programs, installation of lighting controls is not mandatory.

With more complex lighting retrofit programs on the horizon, there may be a need for increased coordination between utilities and their trade allies for lighting retrofits. While most utilities (63%) offer some sort of training for electrical contractors, and nearly one-third (32%) offer design review beyond that of Lighting Design Labs, just three in ten offer marketing support to trade allies and provide their customers a list of approved contractors. (Only 2 of 39 report requiring that program participants work with an approved contractor.)

Most utilities do not appear prepared to make the transition to more complex comprehensive lighting retrofit programs, and seem somewhat reluctant to do so. While the majority of utilities (71%) report that 50% or more of their savings comes from T12 change-outs, most (58%) indicate they have no specific plans for changing incentives following the T12 phase-out beginning this year, and three-quarters were not aware of any specific plans their utility has for future development of commercial lighting programs.

Barriers of highest concern to the implementation of new comprehensive commercial lighting programs encompass lack of trade ally skills and expertise and increased costs to the customer. Even though the lack of trade ally skills is a key concern, just one-half of utilities either currently offer or indicate they probably would offer training and/or technical services to electric contractors regarding lighting upgrades and retrofits. Training of regional distributors and manufacturers, however, was the most frequent response to a question regarding what roles and strategies NEEA should pursue to best help utilities achieve their commercial lighting retrofit goals.

There are indications of some willingness among utilities to collaborate and transition to more comprehensive commercial lighting retrofit programs. However, a lot of uncertainty remains about how this will be accomplished and how their trade allies and customers will be able to adjust to more complex programs.

List of participating utilities

Avista Utilities

Benton PUD

Benton Rural Electric Association

Big Bend Electric Cooperative, Inc.

BPA

Central Lincoln People's Utility District

Centralia, City of

Chelan County Public Utility District No. 1

Clallam County PUD No. 1

Clark Public Utilities

Clearwater Power Co.

Columbia River PUD

Consumers Power Inc.

Cowlitz County PUD

Emerald People's Utility District

Energy Trust of Oregon

Fall River Rural Electric Co-op

Flathead Electric

Franklin PUD

Grays Harbor PUD No. 1

Idaho Power

Kootenai Electric

Lewis County PUD No. 1

Mason County PUD No. 3

Monmouth Power & Light

NorthWestern Energy

NorthWestern Energy, KEMA Inc.

Okanogan County PUD

Pacific County PUD No. 2

Pacific Power

Puget Sound Energy

Salem Electric

Seattle City Light

Snohomish County PUD

Springfield Utility Board

Tacoma Public Utilities

Umatilla Electric Cooperative

West Oregon Electric Cooperative

11. APPENDIX E: TOPLINE SUMMARY OF TRADE ALLY SURVEY

This section reproduces a memo from Market Strategies International (MSI) outlining a summary of the results from the trade ally survey.

MEMO

To Rita Siong, NEEA
Elaine Miller, NEEA

From Ron Newheiser, Market Strategies

Date August 31, 2012

Re Topline summary: 2012 NEEA Comprehensive Commercial Lighting Initiative (CCLI) Trade Allies Survey

Objectives

The objectives of the 2012 NEEA CCLI Trade Allies Survey are to:

- Provide a comprehensive overview of the standard practices of market actors involved in retrofit projects, prior to the possible widespread implementation of “comprehensive” lighting programs. When NEEA conducts similar surveys in the future, NEEA will be able to track progress in standard practices over time, and potentially attribute them to program activities.
- Assess barriers to comprehensive lighting solutions, as well as issues that would not be apparent from project review such as technical training and market expectations. The survey will also address trade allies’ expectations regarding the forthcoming T12 lamp and ballast phase-out as a result of EISA regulations.

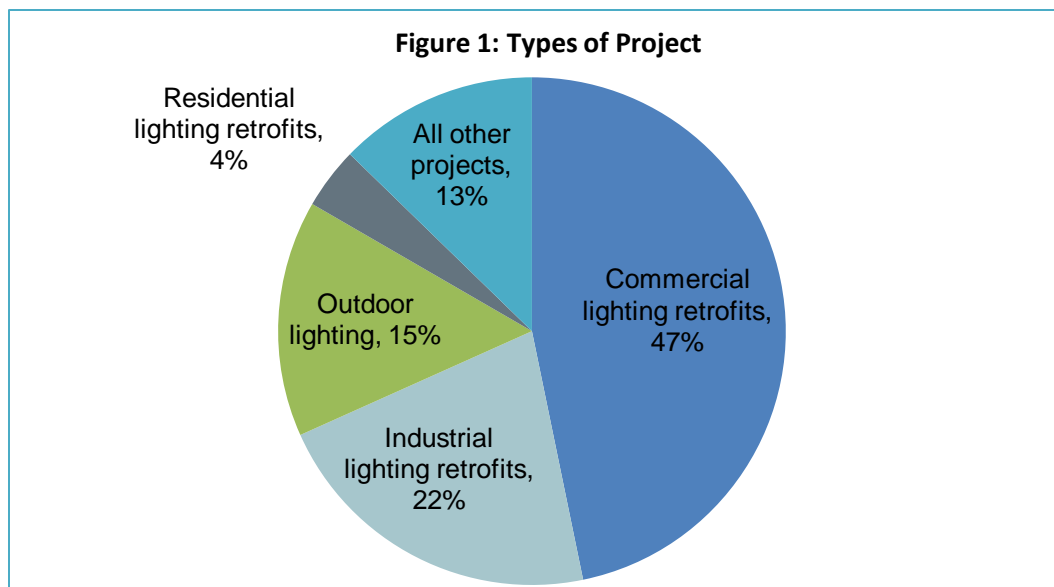
Methodology and Respondent Profile

- Invitations to complete the CCLI utilities survey online were sent via email to 1,037 trade allies in the northwest who are involved in lighting retrofit projects and submit projects to local utility programs.
 - 76 individuals from 38 organizations completed the self-administered survey, which took approximately 30 minutes on average.
 - 6 of 76 (8%) were NEEA Comprehensive Lighting Retrofit Trade Allies Pilot participants.
-

COMPANY SERVICES AND PROJECT MIX

In this section, we asked respondents several questions relating to the different types of services provided and the mix of project work conducted in the Northwest (i.e., Washington, Oregon, Idaho and Montana).

- 57 of 76 (75%) trade allies report that their business specifies or provides advice on the design and layout of lighting equipment. Secondary and tertiary activities include providing lighting design services (67%) and installing commercial or industrial light equipment (58%).
- Two-thirds of trade allies report that 75%–100% of their company’s project work involve lighting retrofits and/or tenant improvements.
- These companies are completing on average 67 commercial and industrial lighting retrofit projects in a typical year.

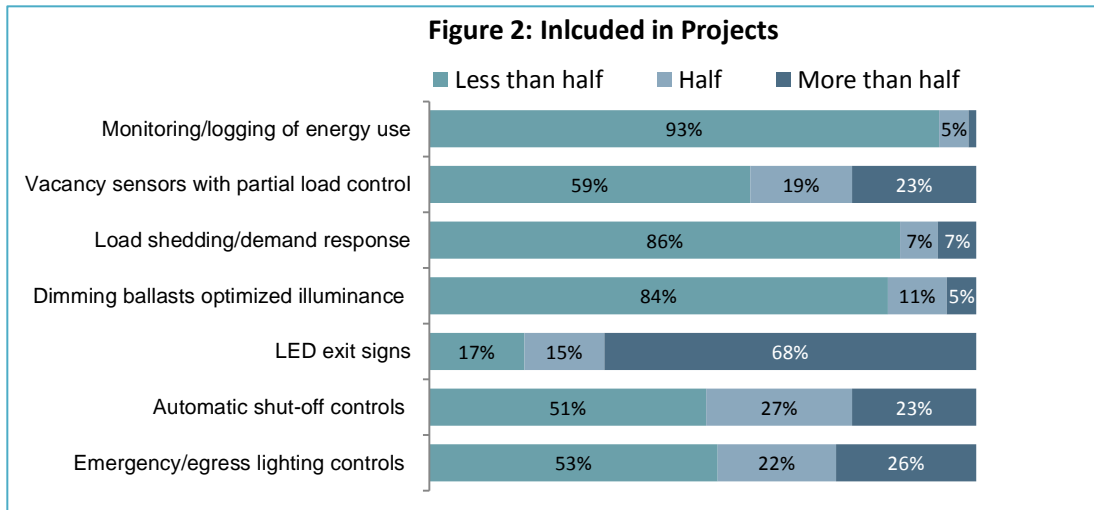


COMMERCIAL AND INDUSTRIAL LIGHTING RETROFIT PRACTICES

This section focuses on the commercial and industrial lighting retrofit projects conducted over the past 12 months.

- The majority of the commercial and industrial lighting retrofit projects include:
 - Specification of light fixtures, lamps and/or ballasts.
 - Cost-benefit analysis.
 - Layout of light fixtures.
- The layout of lighting controls is only included in about half of the projects conducted. Computer modeling and scheduled maintenance of lighting equipment is included in only a few projects.
- These companies also provide services like lighting/energy audits, and provide assistance in recycling old equipment.
- Majority of trade allies (78%) report that at least half of lighting retrofit work in the past 12 months has been T12 change-outs.
- 25 of 73 (34%, excluding 3 who did not know) have had client discussions on all projects in an effort to bring energy efficiency levels for newly constructed buildings at or below code requirements.
- Among trade allies who work in companies that conduct lighting retrofit work, 27 of 69 (39%, excluding 7 who did not know) indicate that all their projects require a permit.
- When selecting all the factors that help them determine target light levels and lighting power densities for lighting retrofit projects, 48 of 75 (64%, excluding 1 who did not know) mention previous personal experience and utility energy efficiency program requirements.
 - One-quarter, 18 of 74 (24%, excluding 2 who did not know), do not consider different options to calculate the lighting power density (LPD) when selecting the final retrofit.
 - Inversely, 39 of 76 (51%) consider alternative options when calculating the annual energy use before selecting the final retrofit strategy for all projects conducted.
- Among trade allies from companies that use some type of metric for setting target light levels, 54% (40 of 74) measure light levels on-site before and after the installation of lighting systems to ensure the original target is met. The companies are also more likely to measure lighting levels afterwards when customers show concern over lighting levels. They also mention that measuring lighting level after retrofitting increases customer satisfaction.
- When asked about specific methods/calculations applied to commercial and industrial lighting retrofit work completed over the past 12 months:
 - Rules-of-thumb (tried and true) methods are most often used across all projects, with 14 of 74 (19% excluding 2 who did not know) applying this method to all projects conducted in the past year.
 - Approximately one-quarter use standard-layout templates (27%), average room illuminance “Lumen” methods (26%), and measurements from hand-held light meters (24%) on about half of the projects.
 - Computer models/designs (e.g., AGI32, Genesys) and monitoring/automated data collection are the least-utilized methods, with 4 in 10 companies applying neither technique at 42% and 43%, respectively, to any project in the past year.

- Among companies who report using standard layouts/templates, six in ten indicate that open warehouse-T8 (66%), open warehouse-T5 (63%), and warehouse T8-aisle lighting (61%) are the most prevalent design templates applied to retrofit projects.
- LED exit signs are included in most of the projects, while monitoring/logging of energy use is implemented in the least number of projects.



- Although companies use products from various manufacturers in their retrofit projects, Sylvania, GE and Phillips are the most common manufacturers whose products are used for lighting retrofits. Lithonia is a popular fixture/luminaire producer while Watt Stopper and Lutron are prevalent in lighting controls. Not surprising, many distributors/vendors are supplying lighting retrofit equipment to these companies.

LIGHT RETROFIT PRACTICES FOR SPECIAL BUILDING/LOCATION TYPES

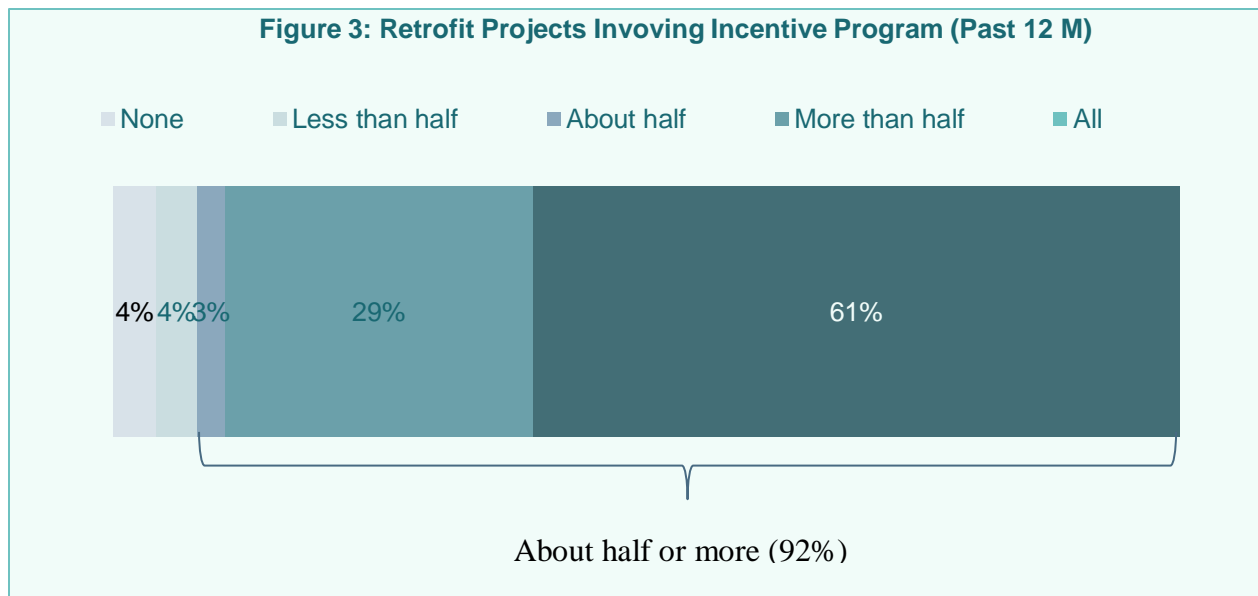
- Results indicate that lighting retrofit work is performed for a broad range of building types and locations. The most common installations are warehouses (93%), exterior lighting projects (84%), offices (83%) and industrial buildings (76%).
- When asked to quantify the number of lighting retrofit projects completed in the past 12 months, more than half (57%) finished 6–10 installations.
- 50 of 61 (82%, excluding 2 who did not know) completed 1–25 office lighting retrofit projects in the past year.
 - Adjusting appropriate ballast factor is applied most often, with 22 of 59 (37%, excluding 2 who did not know) indicating they employ this across all office retrofit work.
 - One-quarter (26%) of respondents include occupancy sensors with partial load control for open offices on approximately half of the retrofit jobs conducted for office buildings.
 - Smart plug strips are the least-utilized component for office retrofit installs: three-fourths (45 of 59, 76%) never used this part on any office project in the last year.

Table 1: Lighting Retrofit Projects Completed in Last 12 Months					
Project types	Office lighting	Warehouse	Retail	School	Exterior
	80%	93%	72%	45%	84%
Average (past 12 months)	27	22	12	5	34
Most common projects	Vacancy sensors for private offices [on/off]	Integral daylight and/or occupancy sensors per fixture	LED spotlights	Vacancy sensors in classrooms	Photo controls
	Occupancy sensors with partial load control for open offices	Optimized spacing of luminaires	LEDs for display cases/refrigerator cases	Optimizing vertical illumination on walls	
	Adjusting appropriate ballast factor	Occupancy sensors with partial load control for aisles/racks	Lighting shutoff after hours for security	Occupancy sensors with partial load control for aisles/racks	

- Companies cite “improvement in the visual environment” and “potential equipment failure” as the main customer concerns. They also mention safety and warranty as other customer concerns.

EXPERIENCE WITH UTILITY COMMERCIAL AND INDUSTRIAL LIGHTING RETROFIT PROGRAMS

- 46 of 76 (61%) state that all retrofit projects completed in the past 12 months involved a utility's commercial and industrial lighting incentive program.



- The majority, 34 of 54 (63%, excluding 19 who did not know), have worked with utility lighting programs that were based on escalating incentive rate tiers to provide deeper savings.
 - For those who worked with escalating incentive rates, 28 of 34 (82%) report having a totally positive (% very/somewhat positive) experience with these programs vs. just 6% who gave a below-average rating (% very/somewhat negative).
- The primary reasons clients opt for deeper savings on commercial and industrial lighting retrofit projects include financial incentives (85%), reduced maintenance costs (62%) and improved quality of the visual environment (50%).
- 45 of 59 (76%, excluding 14 who did not know) cite added capital costs as the primary reason clients decide not to opt for deeper savings on their retrofit projects.
- 35 of 46 (76%, excluding 27 who did not know) state that utility lighting programs that use escalating incentive rates entice their clients to seek deeper savings on their retrofit projects, as well.
- One-half (37 of 74) report that all retrofit projects they were involved in are primarily pursued to help save energy and/or reduce power costs.
- 35 of 59 (59%, excluding 17 who did not know) have worked with one or more utilities that offer a “comprehensive” lighting program that meets current IES light recommendations, meets or exceeds LPD code requirements, integrates lighting controls and takes all lighting in the space into consideration.
 - When asked to rate their overall experience with utilities’ “comprehensive” lighting programs, 29 of 34 (85%, excluding 1 who did not know) gave a totally positive (% very/somewhat positive) rating.

TRENDS AND FUTURE DEVELOPMENT FOR LIGHTING RETROFIT PROJECTS

- Most see the advancement of LED-based lighting system as the future. They also cite that price, which had been a barrier, is starting to come down.
- Over the next three years, most see the lighting business shifting towards LEDs as the cost, which has been a barrier, comes down.
- Most do not see much impact to their businesses from the federally mandated phase-out of some T12 lamps in mid-2012 and T12 ballasts in 2013 as most large businesses and progressive small ones have already eliminated their T12s. Those who have not converted probably won't or will do so very slowly.
- Companies are uncertain how they might modify their activities in response to the T12 phase-out.

EDUCATION AND TRAINING

- Approximately two-thirds of respondents mention trade shows (69%), manufacture websites (68%) and updates from manufacturers (67%) as the key resources used to keep up to date on new lighting technologies and design trends.
- of 36 (64%) use professional organizations and attend local meetings as means to stay current on industry-related technology and trends, followed by one-half who participate in regional events.
- Email is the common method for lighting manufacturers to send updates, with 43 of 50 (86%) conveying that this is typically the format in which they receive them, followed by training sessions (68%).
- Among respondents who attend trade shows, the majority have to maintain membership status with the Northwest Trade Ally Network and Energy Trust of Oregon Trade Ally Network at 89% and 60%, respectively.
- Six in ten respondents who completed training courses report taking one or more classes run by the Northwest Trade Ally Network (68%), a local utility (63%) or a manufacturer (61%).
- of 53 (45%, excluding 23 who did not know) have completed certifications to be a licensed electrician.
- When asked about completing specific training courses, the majority finished course work for LED exit signs (70%) and automatic shut-off controls based on astronomical time clocks or vacancy sensors (69%).

CONCLUSIONS

The survey responses presented above provide the following key findings:

- Many trade allies utilize design templates. Only 17% reported not using any templates.
 - Most commonly used templates were for warehouse spaces, open offices, private offices, gymnasiums, and parking garages.
- Many trade allies (35) believe they have already worked with a “comprehensive” utility program, even though only 6 were actually participants in the Pilot.
 - 85% said they had a positive experience with a “comprehensive” program.
 - Most (82%) trade allies had a positive experience working with escalating incentives, and 76% say escalating incentives encourage clients to go for deeper savings.
 - These results may suggest that trade allies and clients are prepared for widespread comprehensive programs.
- Trade allies have mixed performance on considering energy impacts of different retrofit options.
 - Only 16% always calculate the LPDs of different retrofit options before making a final decision.
 - However, 51% always calculate the annual energy use of different retrofit options before making a final decision.
 - 54% of trade allies measure light levels on site before and after retrofits.
- Trade allies had mixed responses to the upcoming phase-out of T12. T12 replacements are a significant portion of trade allies’ business, but most have no specific plans for changing their business in response to the T12 phase-out.
 - 77% of trade allies report that T12 replacements make up at least half of their business.
 - Many trade allies believe that most businesses have already retrofitted their T12s.
 - Many do not expect the T12 phase-out to impact their businesses.
 - Most trade allies have no specific plans for how to change their business after the T12 phase-out.
- Trade allies see LED as the future of lighting. But more information is needed to make the right choices to take advantage of this new technology.