

# MEMO

**To:** Board of Directors  
**From:** Lindsey Diercksen, Sr. Program Manager – Industry and Agriculture  
Erika Kociolek, Sr. Project Manager – Evaluation  
**Date:** July 9, 2018  
**Re:** Staff Response to Lighting Tool Market Research

Energy Trust of Oregon's non-residential programs (New Buildings, Existing Buildings, Existing Multifamily and Production Efficiency) offer services and incentives for energy-efficient lighting and lighting controls. To estimate savings for lighting and/or lighting controls, Energy Trust developed a Microsoft Excel-based tool ("the lighting tool") which is used by the Existing Buildings, Existing Multifamily and Production Efficiency programs. The tool estimates savings based on information provided by the customer and trade ally contractor or distributor regarding building type, hours of use and characteristics of existing and new equipment (e.g., wattage and fixture quantity), as well as information about market baselines and other codes and standards. The tool also contains a variety of program forms.

As the lighting market continues to evolve, staff have found the current lighting tool to be inflexible and unable to adequately support program design. Energy Trust formed a cross-functional project team to consider changes to the current tool and launched three small market research projects to inform the scope of those changes.

The three market research projects aimed to:

- Understand program stakeholder wants and needs regarding Energy Trust's lighting tool
- Understand what other utility programs are using currently for similar lighting tools and future plans for updates or new tools
- Understand other utility programs' strategies and how future strategies could change the way those programs use tools and forms

The market research projects focused on four groups:

- Energy Trust and its Program Management Contractors (PMC) and Program Delivery Contractors (PDC)
- Pacific Northwest program administrators
- Lighting contractors and distributors
- Program administrators outside the Pacific Northwest

The research revealed that:

- All program administrators are working to understand how to adapt to the dynamic and evolving lighting market and report making or planning to make a number of changes to their programs.
- Many program administrators are using Excel for some portion of their lighting program, e.g., for data capture, storage and/or savings and incentive calculations.
- Energy Trust, PMC and PDC staff reported challenges working with the current tool—namely, conducting quality control and extracting data from the tool for reporting and analysis. However, staff also reported that the tool is comprehensive and has delivered reliable estimates of energy savings over time.

- While contractors reported a number of challenges with the tool, they also noted that the information contained in the tool supports lighting project sales, and that Energy Trust's tool is well-regarded and considered "the standard" as compared to other tools used in the Pacific Northwest.

Given these findings, the cross-functional project team concluded that Energy Trust should hold off on developing a new lighting tool due to the dynamic nature of the lighting market. However, the project team noted that there are opportunities to streamline the current tool and implement incremental improvements to reduce duplicative data entry, enhance quality control and make data extraction easier. The project team recommended that Energy Trust proceed with making improvements to the current tool. The project team also recommended that as non-residential programs develop a strategic roadmap for the lighting portfolio, Energy Trust should prepare to develop tools to support new program designs and strategies. In particular, Energy Trust should pay careful attention to the lead time requirements needed to develop new tools to ensure sufficient development time.

# Lighting Tool Market Research

Final Report

March 6, 2018



Prepared by

**research > into > action**<sup>inc</sup>

3934 NE Martin Luther King Jr. Blvd., Suite 300 | Portland, Oregon 97212  
[www.researchintoaction.com](http://www.researchintoaction.com)

Final Report

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March 6, 2018

Funded By:  
Energy Trust of Oregon

Prepared By:  
Research Into Action, Inc.  
Ellen Rubinstein  
Nathaniel Albers  
Adam Wirtshafter



[www.researchintoaction.com](http://www.researchintoaction.com)

PO Box 12312  
Portland, OR 97212

3934 NE Martin Luther King Jr. Blvd., Suite 300  
Portland, OR 97212

Phone: 503.287.9136  
Fax: 503.281.7375

Contact:  
Jane S. Peters, President  
[Jane.Peters@researchintoaction.com](mailto:Jane.Peters@researchintoaction.com)

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# 1. Introduction

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In December 2018, Energy Trust of Oregon (Energy Trust) selected Research Into Action to conduct research about their existing lighting tool. Energy Trust wanted to hear from program staff, Planning and Evaluation staff, program management contractors (PMCs), and program delivery contractors (PDCs) (hereafter collectively referred to as “stakeholders”) about their experiences with the Energy Trust lighting tool and any other experience they had using similar tools. Energy Trust also wanted to learn about the experiences of other program administrators in the region using lighting tools.

## 1.1. Energy Trust Lighting Tool Summary

Energy Trust developed the current Excel-based lighting tool over the last decade to calculate the savings and program incentives for energy-efficient lighting and lighting controls offered through several of Energy Trust’s non-residential programs: Production Efficiency, Existing Buildings, and Multifamily. The tool uses information including building type, hours of use, existing and new equipment characteristics (e.g., wattage and fixture quantity), and market baselines and other pertinent codes and standards as inputs. In addition to these inputs, the tool incorporates details about incentive reservations (in Form 120L), project completion dates (in Form 140L), and lighting incentives (in Form 190L). Energy Trust uses Extensible Markup Language (XML)<sup>1</sup> to extract select information from the lighting tool and send it to Energy Trust’s Project Tracking (PT) system.

Energy Trust staff, along with Evergreen Consulting Group, LLC (Evergreen) staff, are some of the lighting tool’s primary stakeholders. Evergreen serves as PDC for the Production Efficiency program and serves as the lighting specialty subcontractor to the PMCs who manage Energy Trust’s other non-residential programs. In addition, Evergreen manages the trade ally network of lighting contractors and distributors, and provides other technical services, such as lighting specialist support for participating projects and measure development work for all non-residential programs.

Lighting contractor and distributor trade allies are also important users of Energy Trust’s lighting tool. They act as a sales force for Energy Trust’s non-residential programs by promoting energy-efficient lighting and lighting controls directly to customers. Trade allies input project data into the tool while they are “in the field” at customer sites or at their own businesses.

## 1.2. Research Objectives

As Energy Trust’s non-residential programs continue to adapt to the evolving lighting market, some program staff are finding the current lighting tool insufficiently flexible to support program design. Specifically, these staff have noted that the tool:

- › Cannot easily calculate incentives that are based on multiple factors and baseline conditions;
- › Cannot accommodate more macros;

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<sup>1</sup> XML is a programming language that users may employ to, “...create a tagging scheme that allows elements of a documents to be marked according to their content rather than their format.” (See: <http://www.dictionary.com/browse/xml?s=ts>).

- › Contains valuable data that are not currently extracted and stored in Energy Trust's PT and Customer Relationship Management (CRM) systems; and
- › Is typically saved locally by trade allies, so older versions cannot be updated.

Energy Trust is considering updating the lighting tool in 2018 and 2019 and is seeking input from Energy Trust stakeholders as well as other program administrators.

This research effort seeks to:

1. Understand stakeholders' wants and needs regarding Energy Trust's lighting tool.
2. Understand the tools other program administrators currently use to calculate lighting savings and incentives, and any plans they have to update and/or develop new lighting calculator tools.
3. Understand other program administrators' lighting program strategies, and how possible changes to those program strategies may affect their use of lighting tools in the future.

In a separate but related study, Energy Trust is supporting research focused on an important group of stakeholders: trade allies. For that study, Evergreen is interviewing contractors and distributors about their use of the lighting tool to learn about what changes, if any, the contractors and distributors would like to see.

The remainder of the report is organized as follows:

- › Chapter 2: A review of methods.
- › Chapter 3: A review of findings from the interviews and document review.
- › Chapter 4: Conclusions and recommendations.

## 2. Methods

### 2.1. Document Review

To initiate this study, Research Into Action reviewed multiple files from Energy Trust related to the lighting tool and to the lighting market more generally. The document review helped us understand the details of how the tool works, what contractors and customers see when using the tool, and what Energy Trust staff see when reviewing the tool and extracting data from the tool. The document review, coupled with a kickoff meeting with Energy Trust staff, provided us with a deeper understanding of the needs of this study and informed the development of the interview guides. Table 1 summarizes the files we reviewed and briefly describes how each source informed this research.

**Table 1: Document Review Summary**

Category	Files Reviewed	Notes
Energy Trust Lighting Tool and Forms	<ul style="list-style-type: none"> <li>• Unlocked version of Energy Trust Tool</li> <li>• Completed Energy Trust Tool (2)</li> <li>• Lighting Verification Report</li> <li>• Commercial and Industrial Lighting Incentives (Form 190L)</li> </ul>	<ul style="list-style-type: none"> <li>• Reviewing an unlocked version of the tool allowed us to see the intricacies of the tool.</li> <li>• Reviewing completed tools provided us with examples of what a tool looks like when presented to a customer.</li> <li>• The forms allowed us to see the information contractors provide to customers.</li> </ul>
Reports and Research*	<ul style="list-style-type: none"> <li>• BPA's Lighting Market Intelligence Report</li> <li>• Navigant and Cadeo's Lighting Market Actor Interview Findings</li> <li>• Energy Trust of Oregon: Good, Better, Best Initiative for Lighting; Lighting Strategy and Implementation Plan</li> <li>• Energy Trust of Oregon Lighting Trends, August 2016</li> <li>• TLEDs: The Challenges in Opportunity</li> </ul>	<ul style="list-style-type: none"> <li>• In general, the reports and research provided insight into how the lighting market has changed over the last few years and how it is predicted to change in the near future.</li> </ul>
Marketing Materials	<ul style="list-style-type: none"> <li>• Exterior Lighting Fact Sheet</li> <li>• Industrial Lighting Brochure</li> <li>• Lighting Control Chart Summary</li> </ul>	<ul style="list-style-type: none"> <li>• These materials allowed us to review examples of the collateral customers may see when thinking about a lighting upgrade.</li> </ul>
BPA Lighting Tool	<ul style="list-style-type: none"> <li>• A copy of the BPA Lighting tool</li> </ul>	<ul style="list-style-type: none"> <li>• This tool provided us with something to compare to the Energy Trust tool and see how another jurisdiction designed and arranged their tool.</li> </ul>

\* See Appendix C: References for a detailed list.

Energy Trust has a separate New Buildings program lighting tool, as well as a separate lighting tool for calculating savings for a midstream program. We did not consider these tools in this research, but these tools were mentioned by a couple of respondents during the interviews.

## 2.2. Stakeholder Interviews

To build on the document review, and to gain deeper insight into Energy Trust’s current lighting tool, potential tool enhancements, and alternative tools, Research Into Action talked with Energy Trust representatives—including both Energy Trust and Evergreen staff—and representatives from other energy-efficiency program administrators in the Pacific Northwest. The Energy Trust research manager provided names and contact information for 13 Energy Trust respondents and 10 representatives from other program administrators. The research manager also emailed all potential respondents to notify them that Research Into Action would be contacting them to schedule an interview about the lighting tool (see Appendix A and Appendix B).

Research Into Action developed separate guides for Energy Trust representatives and representatives from other program administrators. We conducted all of the interviews in January and February 2018 and recorded all of the interviews with the respondents’ permission, with the understanding that we would not share the recordings with anyone outside of Research Into Action. Once we completed the interviews, we used interview notes and transcription software to create the data used to analyze responses. We completed analysis using qualitative analysis software and MS Excel to code responses.

### 2.2.1. Interviews with Energy Trust Representatives

Through the Energy Trust interviews, we sought to verify our understanding of how Energy Trust’s tool works and learn about respondents’ experiences with other tools. Specifically, the interviews asked respondents about:

- › Their experience with and use of lighting tools, including what they like about the existing tool and the changes they would like to see.
- › The strengths and weaknesses of an Excel-based tool.
- › Lighting tool updates, including what prompts the updates, the updating process, and who makes the update.
- › Suggestions for developing a new tool, including the capabilities they would most like to see and their insights about how the evolving lighting market should influence the development of a new tool.
- › Their experience with lighting tools from other program administrators and market actors.
- › Other (non-Excel) tool platforms of which they are aware, and the pros and cons of those platforms.

Interviews with Energy Trust representatives explored the existing tool in detail. We asked respondents experienced in reviewing and completing the Energy Trust tool about each tool tab they used and the specific things they liked and disliked about each tab.

Research Into Action completed 12 interviews with 14 Energy Trust representatives (two interviews had two respondents). For the purposes of this report, we use the term “respondents” to refer to the number of interviews completed, rather than to the number of individuals with whom we spoke.

One of the 12 Energy Trust interviews was with a representative from the New Buildings program who had experience with the New Buildings lighting tool, but had limited experience with the tool the other non-residential programs use.<sup>2</sup> In the analysis below, therefore, we use a sample of 12 for topics with which the respondent was familiar (for example, using an Excel-based lighting tool), and a sample of 11 for topics with which the respondent was not familiar.

The interviews with Energy Trust representatives ran between 30 and 75 minutes. Interviews with Energy Trust representatives who had less intimate knowledge of the existing tool tended to take less time than interviews with people who had a thorough knowledge of the tool or interviews with multiple respondents.

### 2.2.2. Interviews with Other Program Administrators

Because we sought “outside” perspectives on many of the questions we asked Energy Trust representatives, we asked representatives from other Pacific Northwest program administrators many of the same questions we asked Energy Trust respondents. Specifically, we covered these topics during our discussions with representatives from other program administrators:

- › Their experience with their organization’s current lighting tool(s), including likes and dislikes.
- › The strengths and weaknesses of an Excel-based tool.
- › Lighting tool updates at their organization, including what prompts the updates, the updating process, and who makes the updates.
- › Ideas for developing a new tool, including the capabilities they would most like to see and their insights about how the evolving lighting market should influence the development of a new tool.
- › Their experience with lighting tools from other program administrators and market actors.
- › Other (non-Excel) tool platforms of which they are aware, and the pros and cons of those platforms.

Research Into Action completed eight interviews with 10 representatives from other program administrators (one interview had three respondents). Thus, for the interviews with other program administrator representatives, we also use the term “respondents” to refer to the number of interviews we completed, rather than the number of individuals with whom we spoke.

The eight interviews with representatives from other program administrators lasted between 30 and 65 minutes.

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<sup>2</sup> The New Buildings program operates differently from the other non-residential programs and therefore uses a different lighting tool. New Buildings projects typically take longer than other projects, and New Buildings projects are not replacing existing equipment; the New Buildings tool takes these factors into account.

## 3. Findings

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This chapter begins with a brief overview of how Energy Trust and other Pacific Northwest program administrators use their lighting tools and summarizes trends in the lighting market that may affect how lighting tools change. It then presents interview findings about the benefits and challenges Energy Trust and other regional program administrators experience with their existing tools and concludes with a “wish list” of features respondents desire from a new tool.

### 3.1. Lighting Tool Software

Energy Trust has used an Excel-based lighting tool since soon after Energy Trust’s inception. Energy Trust assigns a staff person with *Excel* skills to maintain and update the tool. This person takes input from program and Planning and Evaluation staff and revises the formulas, formatting, and macros necessary to update the tool.

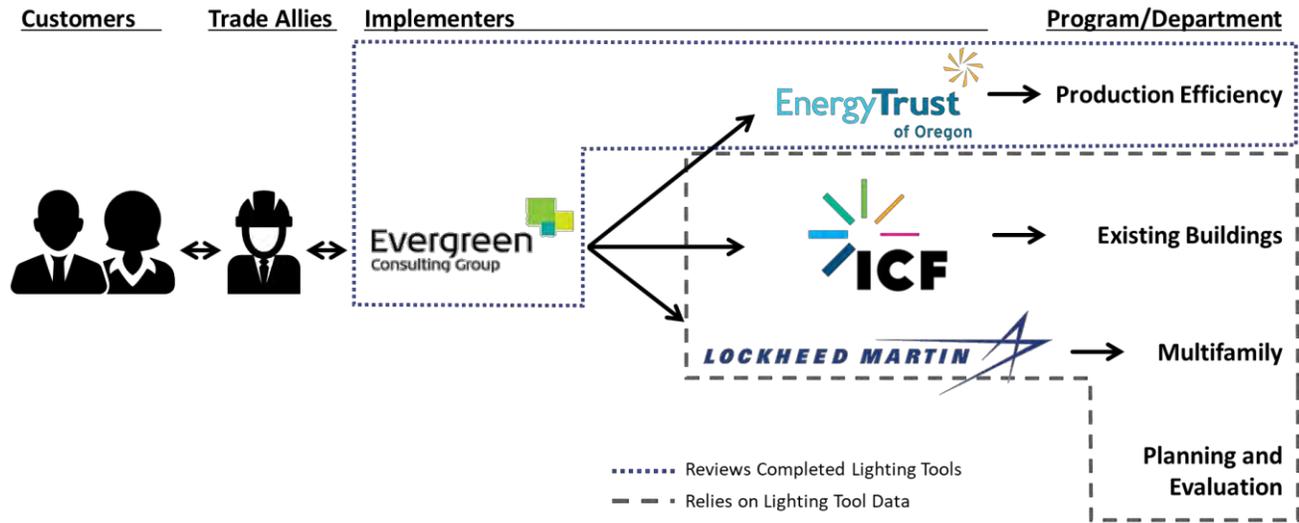
All of the other program administrators we spoke to also reported they have been using an Excel-based lighting tool for a long time. Of the eight administrators, six manage and program their lighting tools themselves, and two use a third-party developer.

### 3.2. Lighting Tool Users

Similar sets of market actors use program administrators’ lighting tools across the Pacific Northwest. All of the program administrators we spoke with rely on contractors and distributors to deploy the tool to non-residential customers in their service territories.

Evergreen oversees the lighting trade ally network for all of Energy Trust’s non-residential programs, despite the fact that each program has its own implementer. Evergreen reviews the lighting tools that the trade allies and other contractors who sell energy-efficient lighting submit. Program implementers and Energy Trust staff then use data from those tools in their program reports, as well as in their Planning and Evaluation work (Figure 1).

Figure 1: Overview of Energy Trust Non-Residential Programs that Use the Lighting Tool



The 11 respondents who were familiar with Energy Trust’s primary lighting tool revealed that Energy Trust representatives interact with the lighting tool in one of two ways, depending on their department. Seven respondents, who are program managers or members of Energy Trust’s Planning and Evaluation departments principally rely on tool data for reporting purposes. Three of the other respondents, all of whom have program operational responsibilities, review completed tools to ensure their accuracy and to verify project savings. The other respondent has multiple responsibilities which include programming changes, reviewing projects, and relying on reports. About half of the respondents provided feedback on specific aspects of the tool – namely, specific tabs.

Those who use the tool for reporting do not interact with it daily, and instead rely on data aggregated from multiple tools. For example, Evaluation staff rely on lighting tool data to better understand incented lighting projects overall. Planning staff rely on the lighting tool data to inform lighting market forecasts and to determine Energy Trust’s list of approved lighting measures (including cost-effective incentive levels). Program staff use Planning’s work to establish measure-specific incentives. Additionally, program managers use tool data to track progress towards savings goals and forecast near term savings.

Other program administrators use their lighting tools in a combination of their commercial, industrial, and new construction programs. Like Energy Trust, the other program administrators share their lighting tools with contractors and other trade allies who help sell projects to potential customers. Trade allies in other jurisdictions also provide completed tools to program administrator representatives for review and use the lighting tools to convey information to their customers, thereby giving customers the opportunity to review the anticipated savings, incentive levels, and expected paybacks, before deciding to move forward with lighting projects.

Respondents from other program administrators played multiple roles with their lighting tools. Almost all reported conducting quality assurance and quality control of lighting tools, many reviewed completed tools, most relied on the tools to provide data for reports, and most had some responsibility for programming or designing their lighting tools.

### 3.3. Tool Updates

Program administrators periodically update their lighting tools in response to lighting market and programmatic changes. This section describes Pacific Northwest program administrators' typical reasons for updating tools and how program administrators communicate those updates to their networks.

#### 3.3.1. Reasons for Tool Updates

Respondents reported updates to lighting tools occur for three reasons:

1. **Regularly scheduled program changes such as measure and incentive updates:** Energy Trust updates its lighting tool annually, as part of its annual budget process. Once Planning identifies all cost-effective measures and sets a maximum incentive value for each, program staff establish measure-specific incentives for their respective programs, staying below the maximum incentive value. Next, typically in December or January, an Energy Trust staff member makes changes to the lighting tool in accordance with the new incentive levels. Energy Trust also makes improvements to the tool's formatting or layout during these regularly scheduled updates.

Other program administrators also try to update their tool to coincide with regularly scheduled program changes. For example, one respondent reported they update their tool every two years to coincide with end of rate periods and program implementation cycles.

2. **Calculation errors:** Energy Trust releases a new version of the lighting tool as quickly as possible after identifying and correcting calculation errors related to a critical aspect of the tool (for example, an incorrect formula resulting in an incorrect incentive calculation). Respondents reported that, though the tool rarely has errors, errors can be introduced due to the difficulty of checking Excel-based tools. (See Section 3.5.2 for a further discussion on this topic).
3. **Mid-course program corrections:** Three representatives from other program administrators reported making changes to their lighting tools in the middle of a program year when they experience far greater uptake of some measures than they had anticipated. The greater uptake means that they exhaust the incentive budget allocated for those measures sooner than expected and therefore have to make adjustments to their tools.

#### 3.3.2. How Tool Updates are Communicated

Energy Trust and other program administrators use similar methods for alerting stakeholders about the release of new versions of their lighting tools. Energy Trust and seven of the other program administrators reported using email to alert their networks of tool changes. Energy Trust and four other program administrators reported hosting the tool on a website from which trade allies can download the tool.

Additionally, as part of the annual release of Energy Trust's updated tool (typically occurs in late January or early February), Evergreen, Energy Trust, and implementation staff host trade ally meetings across the state to discuss a wide range of issues affecting lighting allies, including changes to measures, incentives, and the tool. Energy Trust also communicates with allies on an ad hoc about tool updates. In

these cases, Evergreen or program staff typically send the latest version of the tool to a trade ally via email.

Two respondents from other program administrators reported using a company newsletter to inform end-users about lighting tool updates, and two other program administrators offer trainings and webinars.

### 3.4. Lighting Market Evolution

The non-residential lighting market has been experiencing rapid and significant changes in recent years in terms of both updated lighting codes and standards, and advancements in lighting and lighting control technologies. This section describes the key trends respondents have observed in the lighting marketing and discusses how the respondents think lighting tools may need to evolve in response to the changing lighting market.

The document review we conducted for this study revealed two key trends that will affect energy-efficient lighting programs, and the lighting tools they now use, in the near future.

- › **LEDs and sophisticated controls are becoming the dominant lighting products in the market.**
  - LEDs comprised 15% of all nonresidential lighting in the Pacific Northwest in 2015, up from less than one percent in 2010 (Lighting Market Intelligence Report, 2017).
  - Nationally, LEDs will constitute 48% of lumen-hour sales in 2020 and 84% by 2030 (U.S. Department of Energy (DOE), 2014).
  - Manufacturers are largely focused on producing LEDs. When interviewed manufacturers stated that their production of non-LED products is diminishing, and that they are transitioning to producing LEDs exclusively (Bushman, K. et al., 2016).
  - LEDs may be the only lighting option available in retail stores by 2020 (Lighting Market Intelligence Report, 2017).
  - Unlike just a few years ago, contractors can provide non-residential customers with good, better, and best options that are all LED (Lighting Market Intelligence Report, 2017).
  - In 2012, there were 25,000 LED products in 30 categories from 220 manufacturers. By 2016, there were 201,000 products in 60 categories with 1,500+ manufactures (Lighting Trends, 2016, p. 5).
  - Linear fluorescent tube lighting (e.g. - T12s, T8s, T5s) constitutes 59% of all nonresidential lighting in the Northwest. TLEDs are rapidly becoming the go-to-choice for fluorescent tube lighting retrofits because they are becoming cost-competitive with other options. TLED sales tripled from 2014 to 2015 and forecasts suggest they will become the dominant tube lighting choice in the next couple of years (Lighting Market Intelligence Report, 2017 and Cobb, C. et al., 2016).
  - Controllable lighting is becoming easier to install and use, and lighting controls are becoming more sophisticated largely because of the greater adoption of LEDs (Lighting Market Intelligence Report, 2017).

- › **LEDs are the dominant source of savings in Energy Trust’s programs, but savings per project is declining; this trend is also likely occurring in other jurisdictions.**<sup>3</sup>
  - Ninety-eight percent of all Multifamily lighting savings are from LEDs (Lighting Trends, 2016).
  - Eighty-eight percent of all Existing Buildings lighting savings are from LEDs (Lighting Trends, 2016).
  - Ninety-five percent of all Production Efficiency lighting savings are from LEDs (Lighting Trends, 2016).
  - Savings per project is declining across programs: in 2014, the average savings per project was roughly 42,000 kWh, and in 2016, the average savings per project was 37,500 kWh. Median savings per project is also declining in all programs: between 2013 and 2016 the median savings per project declined by 3,300 kWh, 6,500 kWh, and 4,700 kWh in the Production Efficiency, Multifamily, and Existing Buildings programs respectively (Lighting Trends, 2016).

Most interview respondents echoed our document review findings: the market is changing quickly, LEDs dominate lighting projects incented by Energy Trust, controls will be a critical component in future lighting projects, and per-project savings is decreasing. Five Energy Trust respondents and six representatives from other program administrators emphasized the role lighting controls will play in future program efforts, including as a component of a lighting tool. Three Energy Trust respondents and three representatives from other program administrators noted the growing uptake in TLED adoption in recent years. One Energy Trust respondent observed that if trade allies and Energy Trust representatives continue to spend the same amount of time on lighting project processes, while the size of lighting projects declines, Energy Trust and trade ally resources will experience diminishing returns on their resource investments.

Some respondents also mentioned the following market changes and insights that are beyond those we discovered through the document review.

- › Two Energy Trust and two other program administrator respondents reported more stringent energy codes and standards will reduce the savings they can claim from lighting projects in the future. The two other program administrators said they expect future changes in the Energy Independence and Security Act (EISA) standards will affect baselines across the Pacific Northwest. Because of the more stringent baselines, program administrators will be able to claim fewer savings from lighting projects in the near future. These slimmer margins of savings per project may warrant a different program model, such as moving to a midstream or upstream approach.
- › Three Energy Trust respondents reported that future program designs will require customers to complete comprehensive projects that address multiple end uses and tools that capture both lighting and non-lighting savings (for example, the savings from the interactive effects of lighting and HVAC).

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<sup>3</sup> LEDs likely dominate other program administrators’ projects as well, but our interviews did not include questions specifically about the measures included in other program administrators’ projects.

- › Three Energy Trust respondents and three program representatives from other program administrators questioned whether a new tool is warranted for Energy Trust or any other program administrator due to the ongoing and rapid changes in the lighting market and the time required to design and implement a new tool. Two Energy Trust respondents thought lighting programs should take a more prescriptive approach whereby program administrators could use deemed incentives--that do not require detailed inputs such as hours of use data--for specific measures. A third Energy Trust representative and two other program administrator respondents thought the lighting market may have already evolved to the point that a new lighting tool will not be useful. According to one of these respondents, the lighting market and baselines are continuing to change so rapidly that by the time a new tool is designed and ready for use, lighting will no longer be a major part of program savings.

### 3.5. Benefits and Challenges of Existing Tools

All respondents reported some benefits and some drawbacks to working with their existing lighting tools. We summarize the tools' reported benefits and challenges in this section, beginning with the benefits.

#### 3.5.1. Benefits

Seven Energy Trust respondents and all respondents from other program administrators view the **familiarity** that comes with stakeholders' long-term use that the existing, Excel-based tools as a benefit.

- › Six Energy Trust respondents reported that their familiarity with the tool is a benefit, and two of these respondents specified that there are in-house staff that can modify and design Excel-based tools – something not possible with other platforms. One of these respondents stated, “...we have ample resources at Energy Trust to address Excel issues and roll out repairs quickly.”
- › Five Energy Trust respondents reported that the existing tool is familiar to contractors and distributors, which the respondents view as a benefit because the trade allies are comfortable using the tool.
- › Four respondents from other program administrators specified that because Excel is a familiar platform, the tool was easy to teach to new contractors: prior to working with the tool, most contractors already have access to, and some familiarity, with the platform.

Ten Energy Trust respondents and four other program administrator respondents appreciated the **comprehensiveness** of their tools, explaining that the tools accommodate many needs. Specifically, some liked that the tool captures a lot of data in one place (n=7), calculates cost-effectiveness (n=2), accommodates standard and custom projects (n=1), accommodates all measure and customer inputs in one place (n=1), and the tool gives useful summaries of all the inputs including real and incremental savings (n=1). One respondent specified they liked that all the inputs and forms were together in one workbook, which simplifies their work because they have to send trade allies only one file.

Four Energy Trust respondents explicitly said that the tool has been a **reliable** instrument over time. One respondent noted that the existing tool consistently delivers reliable savings values to Energy Trust and has done so for many years. According to this respondent the realization rate of lighting projects at

Energy Trust is typically in the mid 90% range year after year, thereby demonstrating that the tool accurately captures savings for the programs. Another respondent stated that the tool has been reliable for many years, cannot be used misused by contractors or distributors, and therefore provides reliable savings values. A third respondent said that the tool's design of feeding data across tabs and into forms results in fewer data entry errors and thus a more reliable product. A fourth respondent indicated that the tool accurately calculates savings and incentives. One Energy Trust respondent summed up the reliability of the tool by stating, "[the tool] has been around a long time... and important pieces are done well."

Three Energy Trust respondents mentioned that the existing tool **does not require internet access**, which can be a benefit for those working in rural areas or for those who do not have portable internet access.

### 3.5.2. Challenges

The respondents also mentioned these challenges with their existing lighting tools:

- › Seven Energy Trust and four other program administrator respondents reported challenges **reviewing and conducting quality control (QC) on their existing tools**. One Energy Trust respondent specified that the existing tool requires a level of review and QC that may not be worth the effort as the market changes. Another respondent noted difficulties tracking down errors in Excel-based tools. A third respondent explained that they find it difficult to identify contractors who try to get higher incentives for customers by making projects "custom" when the measures should be "prescriptive."
- › More than half (7) of the Energy Trust respondents and two other program administrator respondents reported challenges extracting data from their tools for **reporting or analysis**. Two Energy Trust respondents stated that aggregated data about specific measures does not automatically go from completed tools to a program database where it can be used for analysis. One of these respondents summed up the situation by saying, "...there is a lot of useful data [in the completed tools] that... goes nowhere." Another Energy Trust respondent noted that the lighting tool is a stand-alone file that is not connected to other Energy Trust lighting tools such as the New Buildings tool and midstream lighting tools. According to this respondent, creating one lighting tool that would enable all lighting data to be in one place could improve analysis and reporting about lighting measures in general.
- › Ten Energy Trust respondents reported that the tool can be **difficult for contractors and other stakeholders to read and use**, which is especially noticeable now that tool users and reviewers are used to nicely formatted apps and web-based applications. For example, one respondent stated that contractors who are new to the tool struggle to figure out how to use it. Another respondent mentioned that contractors find the number of tabs in the Energy Trust tool intimidating and that the tool asks users for a great deal of information. Still another respondent explained that versions of the tool sometimes become corrupted. When this happens, for example, the legal language appears in non-English characters, confusing users.
- › Seven other program administrator respondents noted that some contractors have difficulty using Excel-based tools for **on-site data collection**. According to these respondents, contractors do not always bring laptops to site-visits and end up having to duplicate their efforts: they

gather and record data on-site using pen and paper, and then enter the data into the tool at their office.

- › Five other program administrators reported that their Excel workbook was too large or too unwieldy, **negatively affecting overall performance of the tool.**
- › Three Energy Trust respondents and two other program administrator respondents reported that **the responsibility of updating and programming the tool** typically falls to one person and that responsibility can interfere with other responsibilities. Furthermore, according to another program administrator, when a single person is charged with tool maintenance responsibilities, only that person has up-to-date institutional knowledge about the tool. If that person leaves the organization, the institutional knowledge is lost and others have a harder time making updates to the tool.
- › Three other program administrators reported that contractors experienced challenges or limitations when **using their tools with Apple products and software.**
- › Three Energy Trust and seven other program administrator respondents reported they find **version control** of their tools challenging. Although they did not describe the magnitude of this challenge, the respondents noted that contractors occasionally submit projects using outdated versions of the tool. According to one Energy Trust respondent, version control problems occur under these conditions:
  - A contractor does not submit many projects and is therefore not as “tuned-in” to the trade ally network or communications from program staff about tool changes as are those who submit more projects.
  - A contractor begins a project and completes a lighting tool, but the customer is unable to participate at that time. When the customer is ready to participate a year or two later, the completed tool is out of date and the tool must be redone. In these cases, Energy Trust and other program administrators typically work with contractors to enter project data into the most up-to-date tool, but the respondent noted that doing so takes extra time and resources.

### 3.6. Ideal Lighting Tool

To help us identify the characteristics of an outstanding tool and how it would operate, we asked respondents to brainstorm their “wish list” for an ideal lighting tool without considering the cost and other resources they would need to develop their ideal tool. We summarize responses below for Energy Trust and other program administrator respondents.

#### 3.6.1. Energy Trust Perspective

If Energy Trust were to design a new tool, the majority of respondents would favor moving the tool to an online platform: seven wanted Energy Trust to move to an online platform, three were agnostic and said they would defer to others to decide whether the tool should be online or remain in Excel, and one wanted the tool to remain in Excel.

After discussing tool platforms, the respondents gave their “wish list” of new or refined capabilities for a new tool. Most respondents (n=8) said that improved reporting capabilities would be an important asset for the new tool. Notably, several of these respondents stated that while their reporting needs are met with the current tool’s reporting capabilities, they believed their colleagues would appreciate enhanced reporting options. For example, one respondent who can readily obtain the data they need from the current tool observed that other Energy Trust tool users have difficulty getting data from the tool to meet their needs. Another respondent would like “better access to the project data” so they can perform more detailed analysis and reporting that would better inform program savings pipelines and forecasts.

Other Energy Trust respondent suggestions included:

- › An easier method for updating the tool (three respondents: two from Planning and one program manager).
- › An improved error checking process (three respondents: one from Planning, one program staff member, and one implementer). One respondent provided a specific example of a solution: install controls in the tool to prohibit contractors from submitting projects that should be classified as prescriptive projects as custom projects.
- › Allow contractors to submit a total labor cost rather than requiring they provide measure-by-measure labor costs (one respondent).
- › Prioritize user ease: make the tool easier to navigate and read, and easier for contractors to use (two respondents).
- › Develop a streamlined, easy-to-use process that can better accommodate smaller projects, particularly small multifamily projects (one respondent). The respondent stated that entering information into the current tool for projects with less than \$1,000 in incentives is cumbersome and said contractors have the perception that is not worth the effort to apply.
- › Link the tool to external databases and other information to ease the tool’s data entry requirements (one Energy Trust respondent). For example, link the tool to the Oregon Liquor Control Commission (OLCC) to expedite the required data entry for projects with cannabis customers. As another example, link the tool to utilities’ databases to gather account numbers, and link to the Oregon Department of Energy (ODOE) to verify self-directed projects.

### 3.6.2. Regional Program Administrators’ Perspective

The ideal tool for all of the program administrators from other organizations would be web-based. Specifically:

- › Six respondents stated that a web-based tool could decrease the work for trade allies who complete the lighting tool at a customer’s site. These respondents reported that some contractors complete the tool twice for each project: first, they record project information at the customer’s site using paper and pen, and second they transcribe their hand-written notes to the Excel tool in their office. The respondents said that other contractors fill out a small portion of the lighting tool at the customer’s facility, and then have their staff complete the tool in their office.

- › Five respondents reported wanting a web-based lighting tool that could also serve as a project portal that would allow trade allies and customers to track their project status with less assistance from program staff. These respondents opined that these capabilities would give contractors a greater sense of ownership and awareness about their ongoing lighting projects, and that contractors would therefore need less assistance from program administrator staff.
- › Four respondents mentioned that a web-based tool would enable users to complete the tool on their preferred device (laptop, tablet, or smartphone).
- › Three respondents stated that a web-based approach would enable easier tool updates. They said that each time they update their current tools, they must communicate and release a new version to their entire network of users, which they find cumbersome. In contrast, they noted that they could update a web-based tool without needing to announce and disseminate a new version to their trade allies.

According to seven respondents, an ideal tool would integrate lighting project data, such as counts of specific measures, with their organizations' other systems, thereby improving analysis and reporting capabilities. Two respondents specified that they would like better reporting capabilities to help them identify participation trends and assess market penetration of measures.

## 4. Conclusions and Recommendations

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**Conclusion 1:** Excel-based lighting tools, including Energy Trust’s tool, meet many objectives and have worked well for many years. The tools calculate incentives reliably, are familiar and well-understood by stakeholders, and internal staff can make modifications as necessary.

**Recommendation 1:** Consider making these relatively simple adjustments to Energy Trust’s existing tool to improve its use and performance:

- Develop a formula that computes a default allocation for labor costs across measures, saving contractors the step of developing per-measure labor costs.
- Install controls to prohibit contractors from submitting a project that meets the prescriptive project definition as a custom project.
- Re-craft the macro that creates key variables for inclusion in the Energy Trust CRM to include additional data pertinent to Planning and Program staff. As part of this, work with staff to identify key data points they would like included in Energy Trust’s CRM.
- Develop a more prescriptive path for projects with incentives less than \$1,000, especially multifamily projects, to capture these projects’ savings.
- Identify ways to link to or make it easier to access external data sources that are necessary for reviewing completed tools. This could include access to utility data for account numbers, access to information from ODOE to verify self-directed customers, and access to OLCC to confirm registered cannabis operations.

**Conclusion 2:** While a web-based lighting tool would reduce or eliminate the commonly cited challenges associated with Excel-based tools—for example, the difficulty of performing QC on Excel-based tools, the tools’ inability to communicate directly with other databases to expedite reporting and analysis, and the tools’ readability challenges—program administrators do not necessarily think developing a web-based tool is warranted at this time. Rapidly changing lighting technologies, coupled with coming changes to lighting codes and standards, and expected changes to the lighting program designs, mean that the structure and capabilities of tools stakeholders will want in the near future are somewhat uncertain and may be quite different from structure and capabilities of tools currently in use.

**Recommendation 2:** Energy Trust Planning and program staff should coordinate about potential changes—including the timing of potential changes—Energy Trust may make to its non-residential lighting programs. In addition, Energy Trust Planning and program staff should discuss the types and capabilities of the tools program staff and implementers will need for future non-residential lighting programs.

**Recommendation 3:** Before moving to an online tool, thoroughly scope out the time and financial resources necessary to develop such a tool.

# Appendix A. Energy Trust Staff, Program Delivery Contractors, and Program Management Contractors Interview Guide

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## A.1. Email alert from Energy Trust

Hi [ENERGY TRUST STAFF],

Energy Trust has contracted with the evaluation firm Research Into Action to conduct market research about our Lighting Tool. The goal of this research is to gather feedback on the tool, and the capabilities users would like to see as Energy Trust is considering updates to the tool in the next few years.

Since you are a key staff member working with the Lighting Tool, I would greatly appreciate your participation in this market research project. Research Into Action plans to conduct interviews with you and others. The interview should take about an hour of your time. You can expect [someone from Research Into Action] to contact you soon to schedule an interview.

If you have any questions or concerns, please let me know. Thank you in advance for your time and input.

Thanks, [ENERGY TRUST RESEARCH LEAD]

## A.2. Introduction for Energy Trust, PDC, and PMC Staff

Thanks for taking the time to talk today. As you may know, I work for Research Into Action and we have been asked by Energy Trust to conduct research about the lighting tool their contractors and distributors use to calculate savings and incentives. Energy Trust is considering substantial updates to the tool over the next couple of years to increase its flexibility, and we are interviewing people such as you to gather information about the capabilities that users would like to see. We'll be asking you aspects of the existing tool you think work well, areas you think could use improvement, and the features you would like to see in an updated or new lighting tool.

Our talk will take about 45 to 60 minutes.

Before we begin, it will be helpful to the conversation for you to have a copy of the Energy Trust lighting tool open. There will be times during our conversation where we will want to reference specific aspects of the tool or you may want to direct me to specific parts of the tool. Do you have a copy available to review while we talk?

I'll be audio recording this interview, but this is just for my note-taking purposes; it will only be used by Research Into Action staff and will not be provided to Energy Trust. Is it ok that I record the interview?

Do you have any questions for me before we get started?

### A.3. Roles and Responsibilities

- Q1. Let's start with a bit about you. Please tell me your title, and briefly describe your role and responsibilities with your organization.
- Q2. How long have you been in your current role? How long have you worked in the lighting industry?

### A.4. General Experience with Energy Trust's Lighting Tool

Next, I have some questions about your experience with Energy Trust's existing lighting tool. I'll ask you later about your experience with lighting tools developed by other organizations and your perspectives about contractors and distributors experience with the tool, so for now please focus exclusively on your experience with Energy Trust's tool.

- Q3. Thinking about Energy Trust's lighting tool from a big picture perspective, how do you use the tool, or interact with it, in your current job? [*Probes*: energy savings calculations, incentive calculations, reporting, process applications, analyze data coming from the lighting tool, etc.]
- Q4. And how long have you been working with Energy Trust's lighting tool?
- Q5. In a couple of brief sentences, when you think about Energy Trust's lighting tool from a big picture perspective, what aspects of the tool do you like most? Why?
- Q6. In a couple of brief sentences, what aspects of Energy Trust's lighting tool do you find most challenging, limiting, or frustrating? Why do you say that?
- Q7. Please describe your understanding of how contractors and distributors use the existing lighting tool.
- Q8. In a couple of brief sentences, what aspects, if any, of the current Energy Trust lighting tool do contractors/distributors like the most? Why?
- Q9. In a couple of brief sentences, what aspects, if any, of the current Energy Trust lighting tool do contractors/distributors like the least? Why?

### A.5. Capabilities of the Tool

Now, I would like to ask some more detailed questions about the capabilities of Energy Trust's current lighting tool.

- Q10. Do you have direct experience and familiarity with using the lighting tool? The reason I ask this is because we have some specific questions about each of the tabs in the tool. If you are not that familiar with the individual tabs, we can skip these questions.

[ASK IF FAMILIAR WITH SPECIFIC TABS OF TOOL]

Q11. [Interviewer note: May want to have a copy of the lighting tool open when going through this question] I'd like to go through each of the tabs, or worksheets, in the tool that require inputs from contractors or distributors. To start, which tabs in the workbook do you typically use?

Tab	Typically use?
1. 100 L Information [Completed by TA]	<input type="checkbox"/>
2. Analysis 103L/Addendum [Completed by TA]	<input type="checkbox"/>
3. Controls/Addendum [Completed by TA]	<input type="checkbox"/>
4. LED Case Lighting [1% of projects]	<input type="checkbox"/>
5. Project Estimates [Populated]	<input type="checkbox"/>
6. Estimates Memo [Populated]	<input type="checkbox"/>
7. 120L Incentive Offer [Populated]	<input type="checkbox"/>
8. 140L Completion Certification [Populated]	<input type="checkbox"/>
9. Lookups [References]	<input type="checkbox"/>
10. Incentives [References]	<input type="checkbox"/>
11. 190L Lighting Incentives [References]	<input type="checkbox"/>

[ASK IF Q11\_1 = SELECTED]

Q12. So, for the **100 L Information** tab:

1. What you think works well?
2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_2 = SELECTED]

Q13. So, for the **Analysis 103L Information** tab:

1. What you think works well?
2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_3 = SELECTED]

Q14. So, for the **Controls** tab:

1. What you think works well?
2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_4 = SELECTED]

Q15. So, for the **LED Case Lighting** tab:

1. What you think works well?

2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_5 = SELECTED]

Q16. So, for the **Project Estimates** tab:

1. What you think works well?
2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_6 = SELECTED]

Q17. So, for the **Estimates** tab:

1. What you think works well?
2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_7 = SELECTED]

Q18. So, for the **120L Incentive Offer** tab:

1. What you think works well?
2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_8 = SELECTED]

Q19. So, for the **140L Completion Certification** tab:

1. What you think works well?
2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_9= SELECTED]

Q20. So, for the **Lookups** tab:

1. What you think works well?
2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_10= SELECTED]

Q21. So, for the **Incentives** tab:

1. What you think works well?
2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

[ASK IF Q11\_11= SELECTED]

Q22. So, for the **190L Lighting Incentives** tab:

1. What you think works well?

2. What you personally find challenging or limiting about the tab?
3. What do you think contractors and distributors find challenging or limiting?

## A.6. Tool Platform

- Q23. The current version of the tool is Excel-based. What benefits, if any, do you see to having the lighting tool in Excel?
- Q24. What drawbacks, if any, do you see to having the tool in Excel? Why do you say that?

## A.7. Lighting Tool Updates

The next few questions are about how the existing lighting tool is changed and updated over time.

- Q25. What typically prompts an update to the tool? [*Probes:* A change in measures, the need to change incentives, an error that was found, updates to terms and conditions, regular intervals...]
- Q26. How often is the tool updated?
- Q27. What is the process for updating the existing tool? Who is involved in updates? What is the role of each person or party involved in updates?
- Q28. Do you think the current process for updating the tool works well? Do you think the tool should be updated less frequently or more frequently? Why?
- Q29. Have you found it challenging to ensure all Energy Trust, PDC, and PMC staff are using the current version of the lighting tool? How so? What do you typically do to resolve this issue?
- Q30. How are contractors and distributors notified about updates or new versions of the tool? Do you think this process works well? Why or why not?
- Q31. Have you experienced any challenges, or do you have any concerns about, contractors and distributors using out-of-date versions of the tool? What version-control challenges have you faced? How, if at all, does this differ between contractors and distributors? How have you handled these challenges?

## A.8. Suggestions for New Tool

Now that you've told me about your experience with Energy Trust's existing lighting tool, I'd like switch gears and ask you to think about your "wish list" for a new Energy Trust lighting tool.

- Q32. First, what capabilities would you most like the new tool to include and why? Capabilities might include the following:
- › Ability to easily calculate incentives using multiple factors (quantity, lumen output, time of use) and baseline conditions
  - › Ability to extract more data and information than can be extracted from the current tool

- › Ability to integrate with Energy Trust’s other systems (Project Tracking, or PT, and CRM)
  - › Ability to access the tool online
  - › Ability to update measures easily and more often
- Q33. What platform would you suggest Energy Trust use for its new lighting tool--Excel, online, or something else? Why do you say that? [*Probes: How would an alternative platform provide greater flexibility, better reporting capabilities, better integration with Energy Trust’s other systems, or otherwise improve the tool?*]
- Q34. What changes to the lighting market, if any, do you think should influence the development of a new lighting tool? [*Probes: How should those changes affect the new tool? What do you think is the right balance of being able to update measures versus the need to have a tool everyone understands?*]

## A.9. Experience with Other Lighting Tools

- Q35. Please describe your use and knowledge of lighting tools from other utilities or programs. How familiar are you with these tools?

[ASK IF KNOWLEDGEABLE ABOUT OTHER TOOLS]

- Q36. What aspects, if any, of lighting tools do you like? Why?

[ASK IF KNOWLEDGEABLE ABOUT OTHER TOOLS]

- Q37. What aspects, if any, of lighting tools do you not like? Why?

[ASK IF KNOWLEDGEABLE ABOUT OTHER TOOLS]

- Q38. Has Energy Trust considered using any of these tools you are knowledgeable about? If so, what aspects of the other tool were attractive to Energy Trust?

- Q39. Are you familiar with tools that trade allies/contractors have developed for their purposes? If so, are there any aspects of these tools that would be helpful to incorporate into a new Energy Trust tool? Why?

- Q40. Finally, are there any additional topics or insights about Energy Trust’s lighting tool that we haven’t discussed that you would like to mention now?

Thanks for your time.

## Appendix B. Other Program Administrators Interview Guide

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### B.1. Email sent by Energy Trust

Hi [PROGRAM ADMINISTRATOR STAFF],

Energy Trust is considering updates to our Lighting Tool in the next few years and we have contracted with the evaluation firm Research Into Action to conduct market research. As part of this research, we would like to get feedback from other utilities and program administrators discussing and/or working on current and potential future lighting tools.

I am e-mailing to ask if you would be willing to participate in this research. [Someone] from Research Into Action will be reaching out to you in the next week or so to schedule an interview, which should take about an hour of your time.

We intend to make the final version of the research report, which will summarize feedback from interviewees, available on our website; we expect this to be complete by the start of Q2 2018.

If you have any questions or concerns, please let me know. Thank you in advance for your time and input for this research.

Thank you,

[ENERGY TRUST RESEARCH LEAD]

### B.2. Introduction for Staff at Other Program Administrators

Thanks for taking the time to talk today. As you may know, I work for Research Into Action and we have been asked by Energy Trust to conduct research about their lighting tool used by contractors and distributors to calculate savings and incentives. Energy Trust has determined that their existing tool is insufficiently flexible to support program design and we are interviewing Energy Trust staff and people from other programs, such as yourself, to understand what characteristics of a new tool would be helpful. Therefore, we will be asking you about what aspects of lighting tools you are familiar with that work well, what needs improvement, and what features you would like to see in a lighting tool.

We estimate that our talk will take about 30 to 60 minutes.

I'll be audio recording this interview, but this is just for my note-taking purposes; it will only be used by Research Into Action staff and will not be provided to Energy Trust. Is it ok that I record the interview?

Do you have any questions before we get started?

### B.3. Roles and Responsibilities

- Q1. Let's start with a bit about you. Please tell me your title, and briefly describe your role and responsibilities with your organization.
- Q2. How long have you been in your current role? How long have you worked in the lighting industry?

### B.4. Staff Experience and Use of Lighting Tools

I'd like to start asking about your experience with existing lighting tools, starting off with a couple of general questions about your experience and then get into some more specific questions.

- Q3. Please describe the lighting tool you use. What platform is it (Excel, online, etc.)? and how do you use the lighting tool, or interact with it, in your current job? [*Probes*: energy savings calculations, incentive calculations, reporting, process applications, analyze data coming from the lighting tool, etc.]
- Q4. In a couple of brief sentences, when you think about your lighting tool, what aspects of the tool do you like most? Why?
- Q5. In a couple of brief sentences, what aspects of your lighting tool do you find most challenging, limiting, or frustrating? Why do you say that?
- Q6. Please describe your understanding of how contractors and distributors use your lighting tool.
- Q7. In a couple of brief sentences, what aspects, if any, of your lighting tool do contractors/distributors like the most? Why?
- Q8. In a couple of brief sentences, what aspects, if any, of your lighting tool do contractors/distributors like the least? Why?

### B.5. Tool Platform

Now, I would like to ask about the layout and platform of the tool.

[ASK ALL]

- Q9. Just to verify, you indicated that your lighting tool is [Q3 RESPONSE]. Is that correct? [*Probe*: Is it online, in Excel, something else?]

[ASK ALL]

- Q10. What drawbacks, if any, are there to having a tool in the platform you are currently using? Please elaborate.

[ASK ALL]

- Q11. The current version of Energy Trust's lighting tool is Excel-based. What would you see as the benefits to having a tool in Excel, if any?

[ASK ALL]

Q12. What drawbacks are there to having a tool in Excel? Please elaborate.

## B.6. Lighting Tool Updates

Q13. What typically prompts an update to your lighting tool? [*Probes:* A change in measures, the need to change incentives, an error that was found, updates to terms and conditions, regular intervals...]

Q14. How often is your tool updated?

Q15. What is the process for updating your lighting tool? Who is involved in updates? What is the role of each person or party involved in updates?

Q16. Do you think the current process for updating the tool works well? Do you think the tool should be updated less frequently or more frequently? Why?

Q17. Have you found it challenging to ensure all your staff and implementation staff are using the current version of the lighting tool? How so? What do you typically do to resolve this issue?

Q18. How are contractors and distributors notified about updates or new versions of your lighting tool? Do you think this process works well? Why or why not?

Q19. Have you experienced any challenges, or do you have any concerns about, contractors and distributors using out-of-date versions of the tool? What version-control challenges have you faced? How, if at all, does this differ between contractors and distributors? How have you handled these challenges?

Q20. What systemic changes (such as a change in platform or significant overhaul of your existing tool), if any, is your program or utility planning to make to its lighting tool? If changes are being made, why are those changes being made? If there are no changes planned, have changes been discussed, or should changes be discussed? Why?

## B.7. Suggestions for New Tool

The next few questions are about your wishes for a lighting tool. Specifically, if you and your program were considering changing your lighting tool, what capabilities would you seek?

Q21. Is there anything you wish that a new tool would enable you or your program to do? If so, what, and why?

Q22. First, what capabilities would you most like the new tool to include and why? Capabilities might include the following:

- › Ability to easily calculate incentives using multiple factors (quantity, lumen output, time of use) and baseline conditions
- › Ability to extract more data and information than can be extracted from the current tool

- › Ability to integrate with other systems in your program or utility
  - › Ability to access the tool online
  - › Ability to update measures easily and more often
- Q23. What platform would you suggest Energy Trust use for its new lighting tool--Excel, online, or something else? Why do you say that? [*Probes:* How would an alternative platform provide greater flexibility, better reporting capabilities, better integration with Energy Trust's other systems, or otherwise improve the tool?]
- Q24. What changes to the lighting market, if any, do you think should influence the development of a new lighting tool? [*Probes:* How should those changes affect the new tool? What do you think is the right balance of being able to update measures versus the need to have a tool everyone understands?]
- Q25. How, if at all, is your program incorporating the affects lighting has on energy using equipment and overall energy savings?
- Q26. Has your program expressed any interest in developing a regional lighting tool that could work across multiple programs? What do you see as the benefits and drawbacks to developing a regional lighting tool?

## B.8. Experience with Other Lighting Tools

Before we conclude, I would like to learn about your experience with other lighting tools.

- Q27. Please describe your use and knowledge of lighting tools from other utilities or programs. How familiar are you with these tools?

[ASK IF KNOWLEDGEABLE ABOUT OTHER TOOLS]

- Q28. What aspects, if any, of lighting tools do you like? Why?

[ASK IF KNOWLEDGEABLE ABOUT OTHER TOOLS]

- Q29. What aspects, if any, of lighting tools do you not like? Why?

[ASK IF KNOWLEDGEABLE ABOUT OTHER TOOLS]

- Q30. Has your program or utility considered using any of the tools you are knowledgeable about? If so, what aspects of the other tools were attractive to your organization?

- Q31. Finally, are there any additional topics or insights about your lighting tool that we haven't discussed that you would like to mention now? Anything that would be valuable to Energy Trust that we have not discussed?

Thanks for your time.

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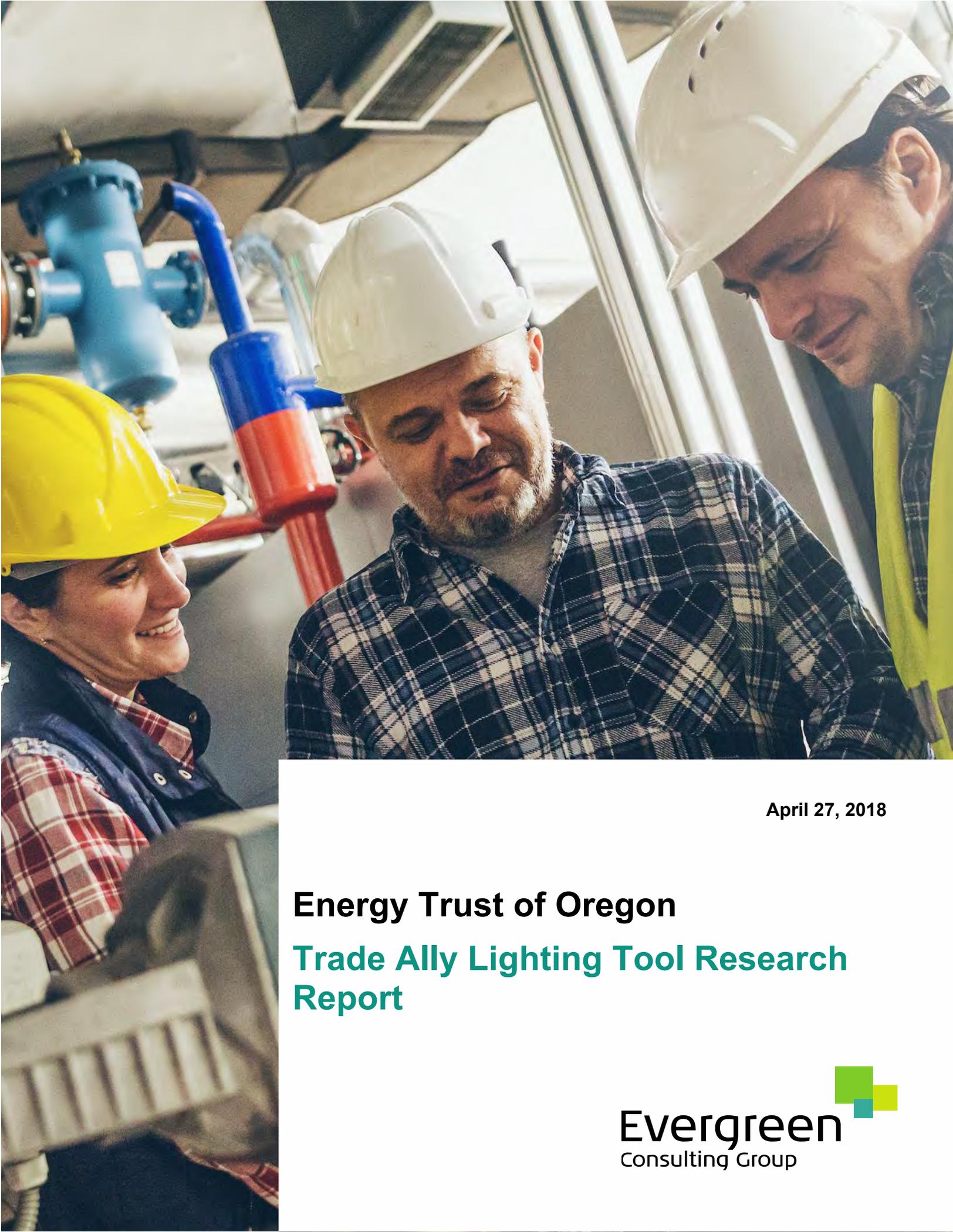
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April 27, 2018

**Energy Trust of Oregon**

**Trade Ally Lighting Tool Research  
Report**

**Evergreen**  
Consulting Group

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## KEY FINDINGS

This report summarizes the results of 30 in-depth interviews conducted by Evergreen Consulting Group for Energy Trust of Oregon among contractor and distributor businesses. Interviews were conducted between January 9, 2018 and February 9, 2018.

The purpose of the interviews was to:

1. Understand how trade ally contractors and distributors currently use Energy Trust's Lighting Tool;
2. Understand trade ally contractors and distributors wants and needs regarding Energy Trust's Lighting Tool; and
3. Understand how Energy Trust's Lighting Tool helps or hinders the sale of energy-efficient lighting projects.

**Research Caveat:** *This research study gathered qualitative data, and while it provides very valuable insights regarding the needs and attitudes of contractors and distributors with regard to the Lighting Tool, it may not be statistically representative. In addition, the suggestions made by contractors and distributors may not be feasible to implement (for example, given Energy Trust's cost-effectiveness requirements).*

Overwhelmingly, contractors and distributors feel that Energy Trust's Lighting Tool ("the Tool") is well-liked and considered the standard relative to others in the region. The Tool is used primarily to calculate incentives, validate and add credibility to contractor and distributor bids, and provide a project scope/audit to prospective customers. All respondents said the Tool brings value to their projects. The Tool itself helps them sell projects, as do the incentives offered by Energy Trust. The Tool is simple to use and is familiar since the Excel platform has not significantly changed over the years. It also provides a means to explain the project savings to utility customers.

Based upon respondent feedback, at a high-level, the considerations for Energy Trust when updating or modifying the Tool include:

- 1. Keep it simple and continue to use a platform that does not require a significant investment of time or money.**
  - a. Provide a tool that will auto-update in-process projects (projects that have not been submitted to Energy Trust) that were created in prior versions of the Tool. Currently, when Energy Trust releases a new Tool, allies have a set period of time to submit sold projects created in prior versions of the Tool. If the allies cannot sell those projects before the new Tool is required by the program for all project submissions, the allies need to re-key the entire project into the new Tool. This is inefficient and added work for the allies.

- b. Most allies were opposed to an online platform. They like the ability to download the current Tool and work on it anywhere, anytime.
  - c. Responses to a mobile app-based tool were mixed. If it could help simplify data entry (importable), if the use of a mobile app was not mandatory, and if the platform was compatible with a mobile phone – hardware they already have – then the responses to a mobile app-based tool were more favorable.
  - d. Trade allies would like to modify the way installation costs are captured in the Tool and allow Tool users to choose between capturing total project cost or itemized costs.
  - e. Consider simpler incentive calculations (cents/kWh) and incentives that account for design; as lumens per watt increase this will allow for more savings. Currently, all prescriptive measures have pre-set dollar incentives, and those measures eligible for custom incentives must pass a custom cost-effectiveness analysis. In addition, the maximum incentive provided by Energy Trust for any custom lighting measure will never exceed 25¢ per kWh saved or 50 percent of total eligible measure cost. For more information about the eligible incentive structure as of February 1, 2018 see Appendix B.
2. **Include maintenance costs in the Project Estimates tab as a line item.** Maintenance costs were mentioned by 43 percent of the interviewees. Maintenance costs, especially with long-life LEDs, are an important consideration for lighting upgrades. The lighting upgrade may provide a certain dollar amount in yearly energy savings, but maintenance savings makes the retrofit more attractive since it means less down-time for lamp replacement, less staff time to replace lamps, and less money on the replacement lamps themselves.
  3. **More clarification** around what qualifies for custom versus prescriptive incentives.<sup>1</sup>
  4. **The term “cost-effectiveness” is confusing to the customer.** Just because a project does not pass the total resource cost test doesn’t mean it’s a poor investment for the customer.

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<sup>1</sup> Some examples of why custom versus prescriptive needs more clarification from the 2017 Tool include:

- Allowing custom on exterior but not TLED (*except* for 2’ or 6’ TLED lengths).
- Custom is allowed for downlights if installed in an exterior location or if they are under 30-watts.
- No custom for HID screw-in lamps *except* when used in street lighting.
- Custom is allowed for small candelabra lamps, but all other screw-in shapes are prescriptive unless the existing technology is CFL, in which case custom is allowed.
- Custom is allowed if the project reduces any line by a fixture count of 10 percent or greater, or if the proposed watts are higher than the prescriptive offer. (For exterior, 400-watt metal halide to 140-watt LED is prescriptive, but 400-watt metal halide to 175-watt is custom.)
- Custom is allowed for controls if there is more than one source of automated controls (daylight and occupancy). Prescriptive can be selected when custom is not cost-effective.

5. **Provide a means to include ally feedback when making decisions about incentives and Tool updates.**
6. **Allow for personalization.** Inclusion of the ally logo on the Project Estimates tab, ability to add a narrative for the project, and the ability to hide certain columns in the 103L so it can be shared without risk of having competitors use their data to bid against them were key comments.

## INTERVIEW PROCESS

The thirty interviews were in-person (except for two phone interviews) and lasted approximately one hour. Interviewers brought a copy of the Tool with them to help facilitate responses.

- **Selection of the interviewees:** Thirty-five potential interviewees were selected based on their role as contractor or distributor, geographic coverage, length of time working with the Energy Trust Lighting Tool, trade ally status, and activity level.
- **Pre-notification:** An email notification was sent to thirty-three of the thirty-five selected interviewees on January 8, 2018 asking if they would be willing to participate in an interview. Two candidates were kept in reserve in case the sample set of thirty-three did not result in the desired thirty interviews.
- **Completion of final participant interviews:** Evergreen staff interviewed thirty allies between January 9, 2018 and February 9, 2018. The interviewers were Evergreen Consulting Group team members directly assigned to Energy Trust work, including: Jason Glendenning, Mike Hughes, Ben Reher, Simone Auger, Lance Benedict, Kandis Bray, William Gatchell, and Whitney Rideout.

A copy of the interview guide is included in Appendix A.

## INTERVIEWEE SUMMARY

Interviewees ranged from executives/owners to supervisors to account managers to lighting specialists and specifiers. As shown in the box to the right, 33 percent were distributors, 57 percent contractors, and 10 percent turnkey trade allies. (Turnkey allies are those that provide both distributor and contractor services.) Interviewees represented a wide geographical coverage area with participants that have been working with Energy Trust a varying number of years—anywhere from two years to “*from the beginning*” of the program, with the average number of years working with the program being 9.6. In addition, the number of Lighting Tools completed per month ranged from 0.5 to “*between 60 and 90*”, with the average number of Lighting Tools completed per month being 12.9. In most cases there were a limited number of employees within the trade ally organizations who complete the Lighting Tools. The specialization of Lighting Tool work enables other staff to focus on sales and installation work.

A series of questions were asked to identify the percent of total sales that comes through lighting projects, along with follow-up questions to ascertain the percent of lighting projects that are energy-efficient, how many of those projects are in Energy Trust territory, and finally, how many Energy Trust lighting efficiency projects receive incentives from Energy Trust. A summary of these responses is shown in the table below.

Half of respondents reported that at least half of their company’s projects are lighting-focused. Almost three-quarters (73 percent) of respondents reported that 75-100 percent of their company’s lighting projects are focused on energy-efficient technology. Seventy percent of respondents reported that 75-100 percent of their company’s lighting projects focused on energy-efficient technologies are in Energy Trust territory, and 93 percent of respondents reported that 75-100 percent of their company’s lighting projects focused on energy-efficient technologies in Energy Trust territory receive incentives.

### Interviewee Summary

#### Trade ally composition:

- Distributors: 33%
- Contractors: 57%
- Turnkey: 10%

#### Geographical coverage:

- All regions: 15%
- Portland Metro: 35%
- Central Valley: 21%
- Southern Oregon: 18%
- Bend/Redmond: 9%
- Eastern Oregon: 3%

#### Number of years working with Energy Trust programs:

- >= 10 years: 50%
- 5-9 years: 40%
- < 5 years: 10%

**The average was 9.6 years.**

#### Number of Lighting Tools completed per month:

- >= 50: 3%
- 20-49: 24%
- 10-19: 21%
- < 5: 52%

**The average was 12.9 tools per month.**

Range	What % of your company projects are lighting focused?		Of those lighting projects, about what % are focused on energy efficient technology?		Of those energy efficient lighting projects, about what % are in Energy Trust territory?		Lastly, of those Energy Trust territory projects, about what % receive incentives?	
	Response number	Percentage	Response number	Percentage	Response number	Percentage	Response number	Percentage
75% - 100%	12	40%	22	73%	21	70%	27	93%
50% - 74%	3	10%	4	13%	4	13%	0	0%
25% - 49%	3	10%	2	7%	5	17%	1	3%
1 - 24%	12	40%	2	7%	0	0%	1	3%
Did not respond	0	0%	0	0%	0	0%	1	3%

## DETAILED FINDINGS

The findings from these interviews are organized by the following sub-sections:

- **Big Picture Perspective** - what aspects of the Tool interviewees like the most and find the most challenging.
- **Tool Use and Functionality** - an overview of how the Tool brings value to efficiency projects and suggestions for improvement.
- **Other Programs** - an overview of how interviewees work with other efficiency programs and key learnings from those programs.
- **Lighting Tool and Project Sales** - an overview of the Tool as it relates to project sales, information that is important when selling efficiency projects, how that information is conveyed, and whether the Tool is used specifically to sell projects.
- **Lighting Tool Logistics** - how interviewees prefer to access the Tool and why, considerations for Energy Trust when deploying tool changes, how the current Excel platform works for interviewees, and whether other platforms like online or apps would be of interest.
- **Final Comments** - interviewees were asked to share any final thoughts they felt important to convey about the Lighting Tool and suggestions for the future.

### Big Picture Perspective

Interviewees were asked to think about the Energy Trust Lighting Tool from a *big picture perspective* (questions 6, 6a, and 6b in section 1 of the interview guide) and tell interviewers about the aspects they like the most and why. Three main themes emerged from this set of questions, which are listed below. Note that some interviewees mentioned more than one of the following.

- The Tool supports project sales by providing project calculations, estimating incentives, energy savings and ROI, and presenting the data in one proposal. (60% / 18 of 30 interviewees.)
- The Tool is simple to use on a familiar platform (Excel). (43% / 13 of 30 interviewees.)
- The Tool is a neutral source for information. (13% / 4 of 30 interviewees.)

Contractors and distributors were asked if there were aspects of the Tool that they find the most limiting or confusing (questions 7, 7a, and 7b in section 1 of the interview guide). The most common themes that emerged from this set of questions are summarized below. Note that some interviewees mentioned more than one of the following.

- **Custom versus prescriptive.** Interviewees are confused as to when measures are eligible for custom incentives versus prescriptive incentives. (33% / 10 of 30 interviewees.)<sup>1 above 1</sup>
- **Cost-effectiveness** tests leave savings on the table and the term and its use in documentation is confusing to the customer (17% / 5 of 30 interviewees). An upgrade may not be cost-effective per Energy Trust, but it could be very cost-effective to the customer and there could be valid efficiency savings associated with items deemed not cost-effective by Energy Trust.

- The Tool requires users to show **installation costs per measure** (17% / 5 of 30 interviewees), however, bids are not calculated this way so interviewees reported that there is a lot of guess work to align bids with the Tool. In addition, the Tool will not allow contractors to include all costs; for example, those not associated with the efficiency part of the project. Many projects have costs such as pole installation or running conduit, which cannot be included in the Tool, and interviewees reported needing to include those separately as part of a larger sales package.<sup>2</sup>
- Some interviewees mentioned that the font in the Lighting Tool is too small, and there are unnecessary drop-downs; for example, having a drop-down when there are only two choices, and that drop-downs can be confusing. (17% / 5 of 30 interviewees)
- **It is difficult to get a quick incentive estimate** (10% / 3 of 30 interviewees). The program does not have a path to determine quick incentives.<sup>3</sup>

## Tool Use and Functionality

The first three questions in section 2 of the interview guide focused on Tool use and functionality. Interviewees were asked how the Tool brings value to efficiency projects, and for suggestions for improvement.

The Lighting Tool is well liked and considered the standard relative to others in the region. When asked if the Lighting Tool brings value to projects **all respondents said “yes”**. Interviewees noted that the Tool **sells projects**; the ways in which the Tool helps sell projects are summarized below. Note that some interviewees mentioned more than one of the following.

- The project summary information in the Project Estimates Tab is widely regarded as supportive to project proposals; the tab shows a summary of kWh savings, the incentive calculations, total project cost, ROI, and other green information like number of cars taken off the road as a result of the project (37% / 11 of 30 interviewees)

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<sup>2</sup> To understand why installation costs pose challenges to interviewees, readers should take into consideration how bids are developed, how many entities are involved, and how product and pricing trickles down. Manufacturers sell to the distributors and sometimes direct to the contractor. They build pricing as appropriate for the sale. Distributors quote everything electrical (pipe, wire, switch gear and fixtures) as one package to the contractor. The contractor takes the electrical and lighting equipment bid and uses that to develop one project bid for the customer. Contractors add an all-inclusive estimate of labor. The contractor has no accurate way to extract the exact cost for one line item in a Lighting Tool from the project as a whole.

<sup>3</sup> Every project must have a completed and approved Lighting Tool:

- Projects that have an incentive of less than \$6,000 need to be reviewed and approved by the Project Coordination team. If any measures are entered incorrectly, this could impact the incentive and time before a 120L is issued for signatures. The 120L reserves the incentive.
- Projects that have an incentive of over \$6,000 require an on-site pre-verification walk by a Lighting Specialist. Once the project has been verified by a Lighting Specialist and a Project Coordinator, the 120L is issued for signatures.

- ROI specifically was mentioned as a piece of information that brings value to projects (13% / 4 of 30 interviewees)
- Interviewees said that incentives specifically are a key contributor to project sales (27% / 8 of 30 interviewees)
- Interviewees also mentioned that the Tool validates and adds credibility to contractor and distributor bids (20% / 6 of 30 interviewees)

The most important values/features from the Tool are listed below. Note that some interviewees mentioned more than one of the following.

- Incentives (40% / 12 of 30 interviewees)
- ROI (23% / 7 of 30 interviewees)
- Project Estimates tab (27% / 7 of 30 interviewees)
- Project costs (13% / 4 of 30 interviewees)
- Validation of bid from an independent third party (7% / 2 of 30 interviewees)

The least important value/feature from the Tool are listed below. Note that some interviewees mentioned more than one of the following.

- The green information on the Project Estimates tab (which provides information such as the number of cars off the road as a result of the project, and is included in Appendix C) (17% / 5 of 30 interviewees)
- kWh (10% / 3 of 30 interviewees)
- Square feet of the space (7% / 2 of 30 interviewees)
- Account number (3% / 1 of 30 interviewees)
- Incentive (3% / 1 of 30 interviewees)

Interviewees were also asked for general areas for Tool **improvement**, as well as specific items related to the 100L and measure entry as those two categories cover data entry. Interviewees said:

- Simplify data entry into the Tool. Users are busy and anything that can be done to reduce time spent on data entry would be appreciated (13% / 4 of 30 interviewees)
- They would like a faster way to calculate a rough estimate of incentives so they can give this to their customers (10% / 3 of 30 interviewees)
- Cost-effectiveness language is confusing to customers (7% / 2 of 30 interviewees)
- Add in maintenance savings. With LED technology this is becoming more important for selling projects. (7% / 2 of 30 interviewees)
- Making the font size larger (7% / 2 of 30 interviewees)
- Ability to hide areas they do not want the customer to see, so that they could give the customer the Tool but not give all their propriety information away in case the customer gives the information to a competitor for another bid (3% / 1 of 30 interviewees)
- Comments related to improving the 100L included:
  - Eliminate “square feet” – it’s not easy to get and is often wrong (10% / 3 of 30 interviewees)

- Auto-populate customer data from past Tools (10% / 3 of 30 interviewees)
  - Reduce the number of options for building use type (10% / 3 of 30 interviewees)
  - Eliminate the requirement for an account number (3% / 1 of 20 interviewees) and make the account number easier to enter into the tool (3% / 1 of 30 interviewees)
- Comments related to improving measure entry were varied, but focused on drop-downs. Seventeen percent (5 of 30 interviewees) indicated the drop-downs used in the 103L were “clunky” or “hard to manage”.

## Other Programs

Question 4 in section 2 in the interview guide focused on the other efficiency programs interviewees work with, and considerations from those programs for Energy Trust when revising the Tool.

Most interviewees said that they participate in other efficiency programs. The vast majority participate in BPA programs, PSE, Seattle City Light, Central Electric Co-Op, and Tacoma Power – the table below summarizes the other efficiency programs with which interviewees reported working.

<b>Program</b>	<b>Percentage of Interviewees Working with Program</b>
"BPA Utilities"	63%
Puget Sound Energy	13%
Seattle City Light	13%
Central Electric Co-Op	10%
Tacoma Power	10%
City of Ashland	7%
Clark PUD	7%
Idaho Power	7%
Salem Electric	7%
SnoPUD	7%
Avista	3%
Blachly-Lane Electric Cooperative	3%
Central Lincoln PUD	3%
Columbia River PUD	3%
Coos/Curry Electric Cooperative	3%
Emerald People's Utility District	3%
Eugene Water & Electric Board	3%
Lane Electric	3%

Mid-State Electric	3%
Pacific Power (outside Ore.)	3%
PG&E	3%
Redding Electric Utility	3%
Southern California Edison	3%
Springfield Utility Board	3%
Umatilla Electric Cooperative	3%

**Interviewees prefer the Energy Trust Lighting Tool functionality and use when compared to tools used by other programs.** That said, the interviewed contractors and distributors reported that other utility program tools included some **features they liked, and that Energy Trust should consider emulating:**

- Maintenance cost savings are included (19% / 5 of 26 interviewees)
- Incentives are calculated based on cents/kWh (15% / 4 of 26 interviewees)
- There is an option to enter for itemized **or** total project cost (12% / 3 of 26 interviewees)

When asked about other program tools and version control, interviewees mentioned that most were available online for download and they are Excel-based. Interviewees specifically noted that BPA’s tool is not updated as frequently as the Energy Trust Tool and this is something they like; it provides more consistency and requires less training year over year. That said, interviewees mentioned that they appreciate the monthly Energy Trust email updates that are sent to active trade allies providing a link to the current Tool and summarizing updates to the Tool.

### **Lighting Tool and Project Sales**

Section 3 in the interview guide focused on the Tool as it relates to project sales: information that is important when selling efficiency projects, how that information is conveyed, and whether the Tool is used specifically to sell projects.

The information interviewees find most important when selling efficiency projects to customers is listed below. Note that some interviewees mentioned more than one of the following.

- ROI / ROR / payback (43% / 13 of 30 interviewees)
- The incentive offer (43% / 13 of 30 interviewees)
- Energy savings (30% / 9 of 30 interviewees)
- Project cost (27% / 8 of 30 interviewees)
- Project Estimates tab (23% / 7 of 30 interviewees)

When asked how they share that information with customers, interviewees reported the information listed below. Note that some interviewees mentioned more than one of the following.

- Energy Trust Tool Project Estimates tab (43% / 13 of 30 interviewees)
- Their own internal proposal document or tool (27% / 8 of 30 interviewees)

- The Tool or Project Estimates tab is included as part of their own internal proposal document (23% / 7 of 30 interviewees)

Forty-seven percent of interviewees (15) reported that they have their own tool or proposal document to convey project sales proposals. When asked which features of their own proposal documents Energy Trust should consider emulating, interviewees mentioned:

- Include maintenance costs (33% / 5 of 15 interviewees)
- Utilize more graphs and visual information to show savings and life cycle savings (13% / 2 of 15 interviewees)
- Provide areas to add text so allies can include information specific to the project, maintenance savings, or other considerations like safety (13% / 2 of 15 interviewees)
- Allow allies to hide or remove proprietary information (e.g. pricing) (7% / 1 of 15 interviewees).<sup>4</sup>

Interviewees overwhelmingly use the Tool to sell projects (83% 23 of 30 interviewees). The methods that make this successful are listed below. Note that some interviewees mentioned more than one of the following.

- Project information is on one page; it is easy to read, clear and concise (44% / 11 of 25 interviewees)
- Incentives and how those help with project costs (16% / 4 of 25 interviewees)
- It is an approved Energy Trust form (12% / 3 of 25 interviewees)

## Lighting Tool Logistics

Section 5 of the interview guide focused on Lighting Tool logistics: how interviewees prefer to access the Tool and why, considerations for Energy Trust when deploying tool changes, how the current Excel platform works for them, and whether other platforms like online or apps would be of interest.

When asked how participants like to access the Lighting Tool, most interviewees mentioned “email” or “download” so it can be saved for later use. Many interviewees agreed that it is easier to work on their computer anytime, anywhere. **One hundred percent of interviewees said the current Excel platform works well**; it is their preferred platform since it is well-known and familiar.

The primary considerations Energy Trust should have when deploying Tool changes are listed below. Note that some interviewees mentioned more than one of the following.

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<sup>4</sup> Sharing the whole Tool with the customer means pricing information and detailed project information could then be shared with other allies for more competitive bids.

- More notice about future Tool dates and when the new Tools are required, or consistent dates (23% / 7 of 30 interviewees).<sup>5</sup>
- Reach out to trade allies when considering changes to the Tool to get their input (20% / 6 of 30 interviewees)
- Auto-updating, so information in older versions of the Tool does not have to be re-keyed (10% / 3 of 30 interviewees)

## Online Platform

The last part of section 5 of the interview guide included questions about a possible online platform. All but one interviewee mentioned that they have robust internet connections in their office. However, 63 percent of interviewees said an online platform would **not** be helpful. Thirty percent said it would be helpful *if it was easy* and simplified the process, and three percent (one respondent) said an online platform would be better than the current Excel-based tool.

Interviewees that said an online platform would not be helpful have had poor experiences with regional tools, where the tool is *similar* to an online experience that requires step-by-step data entry and does not allow simple input to quickly calculate incentives. Excel is familiar to users, does not require connectivity, and can be worked on in the office or in the field.

Not all comments were negative; one interviewee mentioned that an online platform would solve the Apple/Windows compatibility issues associated with the current Tool, and another interviewee said that an online platform would ensure each project was completed in the most current version of the Tool.

## Tablet-Based App

Question 3 in section 5 of the interview guide asked interviewees if the current Excel-based Tool worked for their needs. Question 3b was a follow-up asking specifically if a tablet-based app would be helpful. Interviewees were keener on a tablet-based application than an online platform, with 37 percent of respondents saying they were not interested in a tablet-based application, 33 percent saying they thought a tablet-based application would help provide certain functionality, and 23 percent saying they were interested in a tablet-based application. Although the question was intended to ask about a tablet-based app **replacing** the current Excel platform, all but two interviewees who provided positive comments did so with the

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<sup>5</sup> As background: The Tool receives several revisions per year to account for fixes and adjustments, but the most significant update comes at the first of the year with incentive and program changes (“major release”). The major release date varies from year to year, but usually occurs sometime between the end of January through the end of February. After the major release, users have a set period to send in projects that have been scoped on the last revision of the Tool. This time period is usually three or four weeks. Because the release date varies from year to year, and because the time allies have with the prior revision of the Tool varies, notifications become very important so they can manage work flow and customer expectations.

understanding that the app would **complement** a Tool and that the app would not necessarily be tied to a tablet.

Seventeen respondents (56 percent) thought a tablet-based application would help provide certain functionality or were interested in a tablet-based application. Considerations for a tablet-based application mentioned by that subset of respondents included:

- It would need to simplify data entry and be importable into the Tool (53% / 9 of 17 interviewees)
- A phone based application where basic audit information could be gathered and imported into the Tool was mentioned (18% / 3 of 17 interviewees)
- Use photos taken from the field for reference later when developing the bid or for the project file (12% / 2 of 17 interviewees)
- Provide a quick estimate of incentives (6% / 1 of 17 interviewees)

## Final Comments

The last part of the interview guide, section 6, included the following questions:

1. If you could make one change to the Energy Trust Lighting Tool, what would that be?
2. Do you have any final comments for Energy Trust to consider for a future Lighting Tool?
3. Is there anything else we haven't covered you want to mention?

Below are a few high-level themes that emerged from interviewee responses to these three questions. Note that some interviewees mentioned more than one of the following.

- Keep it simple; streamline the overall project submission and payment process and reduce the time from start to finish (23% / 7 of 30 interviewees)
- Consider simpler incentive calculations (cents/kWh) and more flexible incentives to account for design; as lumens per watt increase this will allow for more savings (23% / 7 of 30 interviewees)
- Provide automatic updates to past versions of the Tool so allies do not need to re-key information from old proposals (10% / 3 of 30 interviewees)
- Allow for the addition of maintenance savings (7% / 2 of 30 interviewees)

## APPENDIX A: INTERVIEW GUIDE

### Interview Guide

#### Introduction:

Thanks for taking time to talk with me today. I am working to gather feedback on Energy Trust's Lighting Tool, which you and other allies use to calculate savings and incentives. Energy Trust is considering updates to the tool over the next couple of years, and we are talking with people such as you to gather information about what users would like to see.

Our talk will take about 30 minutes.

Your responses will be treated confidentially. We will only report summary data and will not disclose the responses of any particular individual.

**Company name:**

**Company type:** < distributor / contractor / turnkey >

**Interviewee name:**

**Interview date:**

#### Section 1: Warm Up

1. Let's start with a bit about you. Please tell me your title, and briefly describe your role and responsibilities within your organization.
2. How long have you been in your current role?
3. How long have you been working with Energy Trust's lighting tool?
4. How do you use the tool, or interact with it, in your current job? [*Probes: energy savings, calculations, incentive calculations, reporting, etc...*]
5. About how many Energy Trust Lighting Tools did your company complete per month in 2017?
  - Who in you company completes the tools (sales, project manager, incentive coordinator, administrator, other)?
6. When you think about Energy Trust's Lighting Tool from a big picture perspective, what aspects do you like the most?
  - a. Why? [*Specific examples*]
  - b. Anything else?
7. What aspects of the Energy Trust Lighting Tool do you find the most challenging, limiting, or frustrating?
  - a. Why? [*Specific examples*]
  - b. Anything else?

## **Section 2: Lighting Tool functionality**

**NOTE to interviewers: open up a lighting tool to help facilitate these next sections.**

1. Does the Lighting Tool bring value to projects? *(If the interviewee needs prompting – mention calculate incentives, calculate kWh savings, document projects, sell projects?)*
  - a. If so - how?
    - i. Which is most important and why?
    - ii. Which is the least important and why?
2. Do you think improvements need to be made to the tool? Is so, what are some considerations?
  - a. On the 100L?
  - b. With measure entry?
  - c. Other thoughts?
3. What areas of the tool/entry are the most difficult to understand for you or others in your company?
  - a. For instance, what areas receive the most questions?
4. Besides Energy Trust, what other efficiency programs (if any) do you work with?
  - a. [If 4 = yes] What is your favorite feature of their tool(s)? What should Energy Trust consider emulating?
  - b. What is your least favorite feature?
  - c. What platforms do they use?
  - d. How do they handle version control?
    - i. Is this method effective?
      1. If not – why?

## **Section 3: Lighting Tool and project sales**

1. What information is most important when selling efficiency projects to your customers?
  - a. Why?
2. How do you convey this information?
  - a. Do you have an internal tool or proposal you use to sell projects?
    - i. [If 2a = Yes] What features or information could Energy Trust emulate or include in their tool?
  - b. Do you use the Energy Trust Lighting Tool to sell projects?
    - i. [If 2b = Yes] What has made that method successful and why?

## **Section 4: Company activity with the program**

1. What % of your company projects are lighting focused? Your best guess is fine.

- a. Of those lighting projects, about what % are focused on energy efficiency/efficient technology?
  - i. Of those energy efficiency lighting projects, about what % are in Energy Trust territory?
    1. Lastly, of those Energy Trust territory projects, about what % receive incentives?

## **Section 5: Lighting Tool logistics**

1. How do you prefer to access the Lighting Tool? [< email / download / online / other >](#)
  - a. Why?
  - b. If you work with other programs, what is your preferred way to access their tools and why?
2. What considerations should Energy Trust have when deploying tool changes?
3. The Lighting Tool is Excel based now – does this work?
  - a. Would an online platform be helpful?
    - i. Why?
    - ii. Do you have connectivity issues or a robust connection to the internet?
  - b. What about a tablet based app?
    - i. Why?

## **Section 6: Final comments**

1. If you could make one change to the Energy Trust Lighting Tool, what would that be? (No boundaries.)
2. Do you have any final comments for Energy Trust to consider for a future Lighting Tool?
3. Is there anything else we haven't covered you want to mention?

## **Closing comments:**

**Thanks for your time and feedback.** If you have any additional thoughts that you want to share, please don't hesitate to get in touch with us.

*[After the interview, send a thank-you e-mail with contact information.]*

# APPENDIX B: ENERGY TRUST INCENTIVES EFFECTIVE ON FEBRUARY 1, 2018

## Commercial & Industrial Lighting Incentives

Existing Buildings, Production Efficiency and Multifamily Buildings

Program Information

190L



### Incentives for Energy Efficient Lighting (Effective February 1, 2018)

Energy Trust offers cash incentives to help you implement qualifying energy efficient lighting measures in eligible existing buildings. If you are interested in applying for incentives listed, contact us using the information located at the bottom of the page.

**To apply for lighting incentives, projects must (1) be submitted to Energy Trust for review and pre-qualification before any equipment purchase or installation activity begins; and (2) be pre-qualified for at least \$100 in incentive funding.**

It is important that you contact us for a project review before making purchases or taking other steps that may cause your project to be ineligible for incentives. Additional requirements apply. Program details, including incentives, are subject to change and budget availability. To learn more about Energy Trust's available offers and incentives, visit our website at [www.energytrust.org](http://www.energytrust.org).

### Lighting Project Specifications & Requirements

The following lists provide technical specifications for certain lighting products. Not all products listed qualify for Energy Trust incentives. To qualify for incentives, products and measure installations must also pass Energy Trust cost-effectiveness criteria and meet other program requirements. Contact us for details.

- Proposed LED products must be on the appropriate Qualified Product List (QPL), as indicated below, and under the appropriate categorization to be eligible for incentives:
  - QPL for LED fixtures (except recessed canister downlights) and some LED retrofit lamps - Design Lights Consortium (DLC): <http://www.designlights.org/QPL>
  - QPL for LED recessed canister downlights & other (Certified Light Fixtures) – ENERGY STAR®: <http://www.energystar.gov/productfinder/product/certified-light-fixtures/>
  - QPL for LED lamps (Certified Light Bulbs)– ENERGY STAR®: <http://www.energystar.gov/productfinder/product/certified-light-bulbs/>
- Certain products with additional sizes or attributes outside of the QPL categories or specifications above may also qualify, contact us with questions.

The following requirements apply to lighting projects:

- Energy Trust may require access to perform an on-site review of any project seeking Energy Trust incentives at any point during the project cycle in order to verify incentive eligibility.
- Ballasts and drivers must be compatible with proposed lamps.
- Lighting measures are reviewed in relation to Illuminating Engineering Society (IES) recommendations for minimum light levels and appropriate ratios for the customer's space type and functions. If light levels appear to meet minimum IES recommendations and the specified lighting wattages exceed the measure specifications listed below, then any decision as to whether a specified measure qualifies for prescriptive or custom incentives rests solely with Energy Trust.
- TLED:
  - Trade ally (or installer) must verify the conditions of existing lamp sockets and replace damaged, corroded, and/or cracked lamp sockets.
  - External Driver TLED (TYPE C) versions: labeling is recommended to indicate the fixture has been retrofitted with a TLED and fluorescent lamps should not be installed as replacements.
  - Internal Driver TLED (TYPE A, B, and A/B) versions: label must be affixed in a prominent location on the interior of the fixture in compliance with UL requirements. The label must indicate the fixture has been retrofitted with TLED and fluorescent lamps should not be installed as replacements.
- Lighting measure installations that do not meet industry standards or other Energy Trust program requirements, as determined solely by Energy Trust, will not qualify for incentives. Final determination of eligibility for Energy Trust incentives rests with Energy Trust.
- The maximum incentive provided by Energy Trust for any prescriptive measure will never exceed 50% of total eligible measure cost.

## Commercial & Industrial Lighting Incentives

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Section 1	Custom Lighting Controls and Lighting Upgrades
<p>If you are considering a lighting retrofit or upgrade project and do not see your equipment listed on this information sheet, contact us to discuss whether your project (including lighting controls) may qualify for custom incentives from Energy Trust. To be eligible for custom incentives, proposed custom lighting measures must be reviewed and pre-qualified in advance by Energy Trust and must also pass a custom cost-effectiveness analysis. Contact the program for more information.</p> <ul style="list-style-type: none"> <li>The maximum incentive provided by Energy Trust for any custom lighting measure will never exceed 25¢ per kWh saved or 50% of total eligible measure cost.</li> <li>Custom incentives are not available for certain proposed technologies, such as, manual controls, TLED, linear fluorescent, compact fluorescent (CFL), CFL to LED retrofit lamps, HID to LED retrofit lamps, mercury vapor, incandescent, fluorescent induction, high pressure sodium (HPS), or metal halide (MH).</li> <li>All lighting and lighting controls used for horticulture are required to use the custom lighting calculation. Linear fluorescent and TLED used for horticulture are eligible for custom incentives.</li> </ul>	

Section 2	LED Lamps replacing screw-in incandescent only unless noted.				
<i>Example application: Replace incandescent track head PAR lamp with screw-base LED replacement PAR lamp</i>					
Measure Description	Incentive		103L Analysis Drop Down Selections		
LED lamp with integral driver, less than 20 watts (PAR/R/MR)	\$ 8	per lamp	<table border="1"> <tr> <td>LED_Lamps</td> <td>LED lamp &lt;20W (PAR/R/MR)</td> </tr> </table>	LED_Lamps	LED lamp <20W (PAR/R/MR)
LED_Lamps	LED lamp <20W (PAR/R/MR)				
LED lamp with integral driver 20-40 watts (PAR/R/MR)	\$ 13	per lamp	<table border="1"> <tr> <td>LED_Lamps</td> <td>LED lamp 20-40W (PAR/R/MR)</td> </tr> </table>	LED_Lamps	LED lamp 20-40W (PAR/R/MR)
LED_Lamps	LED lamp 20-40W (PAR/R/MR)				
LED candelabra or globe, greater than 2 watts	\$ 4	per lamp	<table border="1"> <tr> <td>LED_Lamps</td> <td>LED small screw-base candelabra lamp</td> </tr> </table>	LED_Lamps	LED small screw-base candelabra lamp
			LED_Lamps	LED small screw-base candelabra lamp	
<table border="1"> <tr> <td>LED_Lamps</td> <td>LED globe screw-in lamp</td> </tr> </table>	LED_Lamps	LED globe screw-in lamp			
LED_Lamps	LED globe screw-in lamp				
LED A-Lamp	\$ 4	per lamp	<table border="1"> <tr> <td>LED_Lamps</td> <td>LED A-Lamp</td> </tr> </table>	LED_Lamps	LED A-Lamp
LED_Lamps	LED A-Lamp				
CFL to pin base LED operating with existing ballast or removing ballast and 40% minimum savings per lamp	\$ 2	per lamp	<table border="1"> <tr> <td>LED_Lamps</td> <td>CFL to pin base LED</td> </tr> </table>	LED_Lamps	CFL to pin base LED
LED_Lamps	CFL to pin base LED				
<ul style="list-style-type: none"> <li>Specialty/decorative LED lamps <math>\leq 2</math> watts are exempt from the QPL requirement and will be reviewed on a case-by-case basis as a custom lighting measure (see Section 1). A minimum warranty of 3 years is required.</li> </ul>					

## Commercial & Industrial Lighting Incentives

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Section 3		HID to LED screw-in retrofit lamps	
<ul style="list-style-type: none"> <li>• <b>Omni-directional, directional, and high-bay screw-in lamps to retrofit existing HID</b></li> <li>• <b>Lamps using HID ballasts are not eligible for incentives. Ballasts must be removed.</b></li> </ul>			
<p><i>Example application: 250-watt metal halide high-bay fixture converted to 100-watt screw-in LED lamp with old ballast removed and connected to line voltage.</i></p>			
Measure Description	Incentive		103L Analysis Drop Down Selections
HID to LED Screw-in, 35-74W retrofit lamp with 50% minimum wattage savings	\$ 20	per proposed lamp	LED_Lamps   HID to LED Screw-in, 35-74W
HID to LED Screw-in, 75-179W retrofit lamp with 50% minimum wattage savings	\$ 40	per proposed lamp	LED_Lamps   HID to LED Screw-in, 75-179W
HID to LED Screw-in, 180-279W retrofit lamp with 50% minimum wattage savings	\$ 50	per proposed lamp	LED_Lamps   HID to LED Screw-in, 180-279W
HID to LED Screw-in, 280-400W retrofit lamp with 50% minimum wattage savings	\$60	per proposed lamp	LED_Lamps   HID to LED Screw-in, 280-400W
<ul style="list-style-type: none"> <li>• Omni-directional lamps must be used in omni-directional fixtures such as a post-top globe. Directional lamps must be used in directional fixtures such as shoeboxes, wallpacks and downlights</li> </ul>			

## Commercial & Industrial Lighting Incentives

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Section 4		TLED Retrofit	
		<ul style="list-style-type: none"> <li>T8 or T5 TLED diameters replacing any existing technology.</li> <li>If replacing fluorescent, existing ballasts must be removed or replaced.</li> </ul>	
<p><i>Example application: T8 four-lamp recessed troffer to TLED tubes with dedicated driver.</i></p>			
Measure Description	Incentive		103L Analysis Drop Down Selections
<p>TLED</p> <p>Replacing any existing technology, removing existing ballast, replacing with new T8 or T5 ballast, line voltage TLED, or dedicated driver TLED, and achieving 40% minimum fixture wattage savings</p>	\$1.00	per proposed linear foot	TLED 2' TLED lamp (T5 excluded)
			TLED 3' TLED lamp
			TLED 4' TLED lamp
			TLED 5' TLED lamp
			TLED 6' TLED lamp
			TLED 8' TLED lamp
			TLED U-Bent TLED lamp (4' bent to fit 2')
			<ul style="list-style-type: none"> <li>2' size only T5 TLED are not eligible for incentives.</li> <li>TLEDs incentives based on proposed lamp quantities</li> <li>TLEDs using existing T8 or T5 ballast, see Section 8 "Relamp"</li> <li>TLEDs using existing or operating T12 ballasts are not eligible for incentives</li> <li>New fixtures or kits using TLEDs are incentivized as TLEDs only</li> <li>TLEDs are not eligible for custom incentives (except for horticulture use). Contact the program for more information.</li> </ul>

## Commercial & Industrial Lighting Incentives

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Section 5		Interior LED Fixtures			
		<ul style="list-style-type: none"> <li>Retrofit and new fixture options, ballasts &amp; lamp sockets removed</li> </ul>			
<i>Example application: T12 four-lamp recessed troffer to high performance LED retrofit kit.</i>					
Measure Description	Incentive		103L Analysis Drop Down Selections		
Recessed Canister Downlight 30W or less retrofitting or replacing existing incandescent	\$15	per fixture	LED_Interior_Fixtures	Recessed Canister Downlight	
LED fixture or kit, 25W or less 60% minimum wattage savings per measure line required	\$20	per proposed fixture	LED_Interior_Fixtures	LED fixture or kit, 25W or less	
LED fixture or kit, 26-39W 60% minimum wattage savings per measure line required	\$25	per proposed fixture	LED_Interior_Fixtures	LED fixture or kit, 26-39W	
LED fixture or kit, 40-57W 60% minimum wattage savings per measure line required	\$30	per proposed fixture	LED_Interior_Fixtures	LED fixture or kit, 40-57W	
LED fixture or kit, 58-100W 60% minimum wattage savings per measure line required	\$40	per proposed fixture	LED_Interior_Fixtures	LED fixture or kit, 58-100W	
<ul style="list-style-type: none"> <li>Existing single-lamp fluorescent fixture applications must use custom incentive calculation under Section 1</li> </ul>					

## Commercial & Industrial Lighting Incentives

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Section 6		High-bay			
<ul style="list-style-type: none"> <li>Non screw-in only</li> </ul>					
<i>Example application: Replace 400W MH high-bay with a 150W LED high-bay</i>					
Measure Description	Incentive		103L Analysis Drop Down Selections		
LED High-Bay, 40-90W 40% minimum wattage savings per measure line required	\$80	per proposed fixture	LED_High_Bay	LED High-Bay, 40-90W	
LED High-Bay, 91-140W 40% minimum wattage savings per measure line required	\$140	per proposed fixture	LED_High_Bay	LED High-Bay, 91-140W	
LED High-Bay, 141-299W 40% minimum wattage savings per measure line required	\$170	per proposed fixture	LED_High_Bay	LED High-Bay, 141-299W	
LED High-Bay, 300W or greater 40% minimum wattage savings per measure line required	\$220	per proposed fixture	LED_High_Bay	LED High-Bay, 300W or greater	
<ul style="list-style-type: none"> <li>Proposed fixtures must be QPL listed in the high-bay category</li> <li>See Section 3 for HID to LED screw-in retrofit lamp incentives</li> </ul>					

## Commercial & Industrial Lighting Incentives

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Section 7			Exterior Pole/Arm-mounted Area Luminaires, Exterior Wall-mounted Area Luminaires, Parking Garage Luminaires, Fuel Pump Canopy, and Architectural Flood/Spot Lighting	
<ul style="list-style-type: none"> <li>Non screw-in only</li> </ul>				
Example application: Replace 70 watt HID wall pack with 30 watt LED wall pack				
Measure Description	Incentive		103L Analysis Drop Down Selections	
Recessed Canister Downlight (exterior)	See custom - Section 1		LED_Exterior_Fixtures	Recessed Canister Downlight
Exterior LED fixture, 20W or less 60% minimum wattage savings per measure line required	\$40	per proposed fixture	LED_Exterior_Fixtures	Exterior LED fixture, 20W or less
Exterior LED fixture, 21-40W 60% minimum wattage savings per measure line required	\$60	per proposed fixture	LED_Exterior_Fixtures	Exterior LED fixture, 21-40W
Exterior LED fixture, 41-90W 60% minimum wattage savings per measure line required	\$100	per proposed fixture	LED_Exterior_Fixtures	Exterior LED fixture, 41-90W
Exterior LED fixture, 91-140W 60% minimum wattage savings per measure line required	\$140	per proposed fixture	LED_Exterior_Fixtures	Exterior LED fixture, 91-140W
Exterior LED fixture, 141-299W 50% minimum wattage savings per measure line required	\$220	per proposed fixture	LED_Exterior_Fixtures	Exterior LED fixture, 141-299W
Exterior LED fixture, 300W or greater 50% minimum wattage savings per measure line required	\$320	per proposed fixture	LED_Exterior_Fixtures	Exterior LED fixture, 300W or greater
<ul style="list-style-type: none"> <li>Street/roadway lighting is not included here - see <b>PI 190SL-Street Light Addendum</b>.</li> </ul>				

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Section 8		Relamp Only: Existing Linear Fluorescent Fixture	
<ul style="list-style-type: none"> <li>No ballast change out required</li> </ul>			
<i>Example application: 32-watt T8 lamps replaced by 15 watt TLEDs. No ballast change out required.</i>			
Measure Description	Incentive		103L Analysis Drop Down Selections
TLED (relamp) T8 or T5 diameter TLED replacing existing fluorescent, operating on existing ballast, and achieving 40% minimum wattage savings per measure line.	\$0.50	per proposed linear foot	Relamp 2' TLED lamp using existing fluorescent ballast (T5 excluded)
			Relamp 3' TLED lamp using existing fluorescent ballast
			Relamp 4' TLED lamp using existing fluorescent ballast
			Relamp 5' TLED lamp using existing fluorescent ballast
			Relamp 6' TLED lamp using existing fluorescent ballast
			Relamp 8' TLED lamp using existing fluorescent ballast
			Relamp U-Bent TLED (lamp 4' to fit 2') using existing fluorescent ballast
<ul style="list-style-type: none"> <li>2' size only T5 TLED are not eligible for incentives.</li> <li>TLEDs using existing or operating on T12 ballasts are not eligible for incentives</li> <li>TLEDs are not eligible for custom incentives (except for horticulture use). Contact the program for more information.</li> </ul>			

Section 9		Exit Signs			
Measure Description	Incentive		103L Analysis Drop Down Selections		
New Exit Sign, LED (must replace incandescent versions)	\$ 20	per replaced fixture	<table border="1"> <tr> <td>Exit Sign</td> <td>New Exit Sign, LED</td> </tr> </table>	Exit Sign	New Exit Sign, LED
Exit Sign	New Exit Sign, LED				

## Commercial & Industrial Lighting Incentives

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Section 10		Lighting Controls	
<ul style="list-style-type: none"> <li>Controlling loads of 30W or more</li> </ul>			
<i>Example application: Integral warehouse aisle occupancy sensor mounted on T5, LED, or T8 High Bay fixture</i>			
Measure Description	Incentive		103L Controls Tabs Drop Down Selections
Custom control or system. Control devices on connected load less than 30W, or other control or system not detailed here (multi-input control system, advanced controls, LLLC, networked lighting controls)	See custom - Section 1		Custom control or system
Vacancy Sensor (manual on), Wall Switch. (interior)(auto-on version is not eligible for incentives)	\$ 35	per sensor	Vacancy Sensor (manual on), wall switch
Occupancy Sensor, fixture mount (interior) Control loads, 30-149W	\$ 30	per sensor	Occupancy Sensor, fixture mount, 30-149W
Occupancy Sensor, fixture mount (interior) Control loads 150W or greater	\$30	per sensor	Occupancy Sensor, fixture mount, 150W or greater
Occupancy Sensor, ceiling/corner/ surface mount (interior) (hard-wired or wireless), control loads 150W or greater	\$ 105	per sensor	Occupancy Sensor, ceiling/corner/surface mount, control load 150W or greater
Exterior Occupancy Sensor, fixture or pole mounted (wired or wireless), must reduce fixture wattage by at least 50% of proposed fixture wattage in unoccupied mode using dimming, step, bi-level, or on/off, control loads 30-59W	\$ 20	per sensor	Exterior occupancy sensor, fixture or pole mounted, 30-59W
Exterior Occupancy Sensor, fixture or pole mounted (wired or wireless), must reduce fixture wattage by at least 50% of proposed fixture wattage in unoccupied mode using dimming, step, bi-level, or on/off, control loads 60W or greater	\$ 30	per sensor	Exterior occupancy sensor, fixture or pole mounted, 60W or greater

### Existing Buildings, Production Efficiency, and Multifamily Buildings - Common Areas

existingbuildings@energytrust.org ♦ production@energytrust.org ♦ multifamily@energytrust.org  
1.800.326.2917

## Commercial & Industrial Lighting Incentives

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Section 11		LED Cooler/Freezer Lighting		
		<ul style="list-style-type: none"> <li>LED fixtures must be on DLC product list in refrigerated categories</li> </ul>		
LED Display Case Lighting	Measure Description	Estimated Savings	Incentive	
Motion Sensor, on Low Power LED	<ul style="list-style-type: none"> <li>On LED cases, side bar (single)</li> <li>Reach-in or open display cases<sup>1</sup></li> </ul>	10 KWh per linear ft of fixture	\$2	per linear ft of fixture
Motion Sensor, on High Power LED	<ul style="list-style-type: none"> <li>On LED cases, mullion bar (double)</li> <li>Reach-in or open display cases<sup>1</sup></li> </ul>	18 KWh per linear ft of fixture	\$4	per linear ft of fixture
Single Row T8 Low Power LED (Medium Temp Case)	<ul style="list-style-type: none"> <li>Replace T8 with LED side bar (single)</li> <li>Inside reach-in or open display cases<sup>2</sup></li> </ul>	49 KWh per linear ft of fixture	\$10	per linear ft of fixture
Single Row T12 Low Power LED (Medium Temp Case)	<ul style="list-style-type: none"> <li>Replace T12 with LED side bar (single)</li> <li>Inside reach-in or open display cases<sup>2</sup></li> </ul>	83 KWh per linear ft of fixture	\$10	per linear ft of fixture
Double Row T8 High Power LED (Medium Temp Case)	<ul style="list-style-type: none"> <li>Replace T8 with LED mullion (double)</li> <li>Inside reach-in or open display cases<sup>2</sup></li> </ul>	110 KWh per linear ft of fixture	\$20	per linear ft of fixture
Double Row T12 High Power LED (Medium Temp Case)	<ul style="list-style-type: none"> <li>Replace T12 with LED mullion (double)</li> <li>Inside reach-in or open display cases<sup>2</sup></li> </ul>	177 KWh per linear ft of fixture	\$20	per linear ft of fixture
Single Row T8 Low Power LED (Medium Temp Case or Low Temp Case)	<ul style="list-style-type: none"> <li>Replace T8 with LED side bar (single)</li> <li>On the canopy or lip of open display cases<sup>2</sup></li> </ul>	36 KWh per linear ft of fixture	\$10	per linear ft of fixture
Single Row T12 Low Power LED (Medium Temp Case or Low Temp Case)	<ul style="list-style-type: none"> <li>Replace T12 with LED side bar (single)</li> <li>On the canopy or lip of open display cases<sup>2</sup></li> </ul>	61 KWh per linear ft of fixture	\$10	per linear ft of fixture
Double Row T8 High Power LED (Medium Temp Case or Low Temp Case)	<ul style="list-style-type: none"> <li>Replace T8 with LED mullion (double)</li> <li>On the canopy or lip of open display cases<sup>2</sup></li> </ul>	81 KWh per linear ft of fixture	\$20	per linear ft of fixture
Double Row T12 High Power LED (Medium Temp Case or Low Temp Case)	<ul style="list-style-type: none"> <li>Replace T12 with LED mullion (double)</li> <li>On the canopy or lip of open display cases<sup>2</sup></li> </ul>	130 KWh per linear ft of fixture	\$20	per linear ft of fixture
Single Row T8 Low Power LED (Low Temp Case)	<ul style="list-style-type: none"> <li>Replace T8 with LED side bar (single)</li> <li>Inside reach-in or open display cases<sup>2</sup></li> </ul>	68 KWh per linear ft of fixture	\$10	per linear ft of fixture
Single Row T12 Low Power LED (Low Temp Case)	<ul style="list-style-type: none"> <li>Replace T12 with LED side bar (single)</li> <li>Inside reach-in or open display cases<sup>2</sup></li> </ul>	115 KWh per linear ft of fixture	\$10	per linear ft of fixture

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### Existing Buildings, Production Efficiency, and Multifamily Buildings - Common Areas

existingbuildings@energytrust.org ♦ production@energytrust.org ♦ multifamily@energytrust.org  
1.800.326.2917

## Commercial & Industrial Lighting Incentives

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LED Display Case Lighting	Measure Description	Estimated Savings	Incentive	
Double Row T8 High Power LED (Low Temp Case)	<ul style="list-style-type: none"> <li>• Replace T8 with LED mullion (double)</li> <li>• Inside reach-in or open display cases<sup>2</sup></li> </ul>	152 KWh per linear ft of fixture	\$20	per linear ft of fixture
Double Row T12 High Power LED (Low Temp Case)	<ul style="list-style-type: none"> <li>• Replace T12 with LED mullion (double)</li> <li>• Inside reach-in or open display cases<sup>2</sup></li> </ul>	245 KWh per linear ft of fixture	\$20	per linear ft of fixture
<p><sup>1</sup> Motion Sensors – LED Case Lighting Requirements:</p> <ul style="list-style-type: none"> <li>• Incentives are based on linear feet of LED fixture controlled by the motion sensor</li> <li>• Must install a motion sensor controlling permanently installed LED lighting in refrigerated reach-in case(s)</li> <li>• Motion sensor must reduce the lighting load to 20% or less when it senses no activity for more than one minute</li> <li>• Measure is applicable to LED lighting retrofits or existing LED case lighting without a motion sensor installed</li> <li>• Incentive and energy savings values vary based on the controlled LED luminaire power (low or high):                             <ul style="list-style-type: none"> <li>○ Low power luminaire is defined as one that uses &lt; 4.5W/ft of fixture (single)</li> <li>○ High power luminaire is defined as one using &gt; 4.5W to &lt; 8.5W/ft of fixture (double)</li> </ul> </li> </ul> <p><sup>2</sup> LED Case Lighting Requirements:</p> <ul style="list-style-type: none"> <li>• Incentives paid are based on linear feet of installed LED fixture.</li> <li>• LED fixtures must be on the Design Lights Consortium product list in refrigerated categories.</li> </ul>				

# APPENDIX C: SAMPLE PROJECT ESTIMATES TAB FROM THE 2017 LIGHTING TOOL

## Energy Saving and Incentive Estimate



March 3, 2018

### Proposed Lighting Retrofit Prepared by

### Estimated Energy Savings and Energy Trust of Oregon Incentive Package

Based on the lighting retrofit project proposal that has been prepared, we have estimated the energy savings and the incentives that would be available from Energy Trust of Oregon.

Estimated Annual Energy Savings	10,073 kWh
Estimated Annual Cost Savings	\$ 866 per year
Estimated Energy Trust of Oregon Incentive	\$ 2,518
Additional Estimated Incentive, if applicable	\$ -
Estimated Installation Cost	\$ 8,330

Based on your proposed retrofit and estimated installation cost, we show the following financial analysis:

Estimated Installation Cost	\$ 8,330
<i>minus Energy Trust of Oregon incentive</i>	<i>\$ (2,518)</i>
Net Installation Cost	<u>\$ 5,811</u>
Energy Savings Payback (in years)	6.7
% of installed cost paid for by incentives	<b>30%</b>
Rate of Return	15%

Estimated cost for every year the project is delayed	\$ 866
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***This project does not require a pre-installation inspection.***

This is an estimate only, as actual savings and incentives will vary based on final installed measures and costs, actual area operating hours, energy rates and building usage.

**Green Project Box: (Estimate for informational purposes only. The carbon footprint from electricity generation is calculated from a regional average, which may be different than the national average.)**

This proposed project could offset approximately	<b>5</b>	tons of CO2 generated by fossil fuels,
equal to taking more than	<b>1</b>	cars off the road.

## Memorandum

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**To:** Erika Kociolek, Evaluation, Senior Project Manager and Lindsey Dierksen, Senior Program Manager - Industry and Agriculture

**From:** Nathaniel Albers and Ellen Rubinstein, Research Into Action

**Date:** May 24, 2018

**Re:** Lighting Tool Market Research – Perspectives from North American Program Administrators

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## Background and Research Objectives

In December 2017, Energy Trust of Oregon (Energy Trust) selected Research Into Action to conduct research about their existing lighting tool for commercial and industrial projects. Energy Trust wanted to hear from their staff, program management contractors (PMCs), and program delivery contractors (PDCs) about their experiences with the Energy Trust lighting tool and any experience they had using other, similar tools. Energy Trust also wanted to learn about other Pacific Northwest (PNW) program administrators' experience with lighting tools and how they were adapting to the changing lighting market. Our March 2018 report summarized these findings and provided conclusions and recommendations for next steps.

In early April 2018, Energy Trust requested we augment this research by conducting an additional eight to 10 interviews with program administrators located outside of the PNW. The objective of this "Phase 2" research was to learn how non-PNW program administrators use their current lighting tools to calculate savings and incentives, and how—if at all—they plan to adapt those tools in response to the evolving lighting market.

## Methodology

Since the focus of the Phase 2 research was very similar to the focus of the initial (Phase 1) research, we made minor changes to the Phase 1 interview guide for use in Phase 2. Specifically, we tailored the guide to non-PNW respondents by adding a few questions about the context in which the non-PNW programs run. The Phase 2 guide (see Appendix) asked respondents to describe their current non-residential lighting programs, recent and planned changes to the programs, and the drivers of those changes.

Energy Trust provided us with a list of 16 potential contacts representing 12 program administrators across North America. We completed interviews with ten contacts who collectively represented nine administrators. We conducted the interviews in the latter half of April 2018 and each interview lasted for approximately one hour.

The nine non-PNW administrators operated in a variety of regions across North America: three were from the Midwest, three from the Northeast, and one each from California, Canada, and the South. All

of the respondents played key roles in the design or administration of lighting programs for their respective organizations, though their titles and specific jobs varied.

## Findings

When we embarked on this research, we expected our discussions with non-PNW program administrators to center on the details of their lighting tools: the tools' platforms, energy-efficiency programs that use tools, which market actors are responsible for entering data into the tools, the benefits and drawbacks of the tools from different market actors' perspectives, and tool updates. The non-PNW respondents, however, were most eager to talk about lighting program strategies. They explained that they are very focused on determining the program approaches that will be most effective at capturing savings and reducing costs in the rapidly changing lighting market. Even when asked directly and repeatedly about lighting tools, the conversation kept shifting to program strategies. The respondents had comparatively little to say about the existing and future tools they use to calculate and report program savings and incentives. The non-PNW administrators will consider whether to adapt existing tools, and/or develop new tools, as they continue to monitor and react to the market.

The remainder of this section describes the non-PNW administrators' input on lighting program strategies and incorporates, to the greatest extent possible, their feedback on lighting tools.

## Current Lighting Program Offerings

The non-PNW respondents described the following approaches to their current lighting programs.

- › **Downstream programs** provide incentives directly to end users who purchase qualifying energy-efficient equipment.<sup>1</sup> Savings and incentive calculations typically assume that the end user will replace a single inefficient measure with a single efficient measure (one-to-one replacement). Downstream programs come in the following forms:
  - **Prescriptive:** Offer a fixed incentive for the installation of specific equipment that is assumed to replace specific baseline equipment. Prescriptive programs include one of two rebate processes:
    - Simple rebate process: Provide post-purchase incentives to customers who submit receipts for their energy-efficient lighting equipment along with a rebate form.
    - Application process: Require the administrator's approval of the proposed equipment, along with documentation of the baseline equipment and other information, prior to the purchase of the efficient equipment.
  - **Custom:** Offer an incentive based on the end user's unique energy saving opportunities.
- › **Midstream programs** encourage distributors and retailers to stock, sell, and promote efficient equipment to contractors and end use customers. Midstream programs may include distributor

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<sup>1</sup> Qualifying lighting measures are often from the Design Light Consortium's Qualified Products List.

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and retailer incentives that are intended to be passed along to contractors and end users at the point of sale.

As shown in Table 1, all of the respondents administered both prescriptive and custom programs. Two offered simple prescriptive programs in addition to more complex application-based prescriptive programs. Five respondents reported administering midstream programs.

**Table 1: Lighting Program Offerings**

Administrator ID	Downstream			Midstream
	Prescriptive		Custom	
	Simple Rebate	Application Process		
1		✓	✓	
2		✓	✓	
3		✓	✓	
4		✓	✓	✓
5	✓	✓	✓	✓
6		✓	✓	✓
7		✓	✓	✓
8		✓	✓	
9	✓	✓	✓	✓
<b>Total</b>	<b>2</b>	<b>9</b>	<b>9</b>	<b>5</b>

## Capturing Project Data, Storing Data, and Calculating Savings and Incentives

Almost all (eight of nine) administrators reported using Excel for some portion of their lighting program data capture, storage, and/or savings and incentive calculations. However, unlike Energy Trust, which relies heavily on an Excel-based tool for all components of its program, the other administrators did not use Excel-based tools for all data management functions in all of their lighting programs. Instead, the other administrators employed a variety of approaches that depended on the types of lighting programs they offered and the scale of each program type. For example, one relatively small administrator did not use an Excel-based data collection tool in the field. Instead, contractors or end-users completed paper or pdf application forms, and administrator staff transcribed data from these forms and then used Excel to calculate savings and incentives. Another program used a pdf form for its prescriptive program (with an Excel backing for some functionality) and relied on contractors to submit their own work for custom projects. The staff then used Excel to calculate savings and incentives and report back to the contractor or end-user.

## Strategies to Address Lighting Market Changes

All of the respondents are making, or recently made, changes to their program strategies and processes to address changes in the lighting market. Some are also involved in new national collaborative efforts with other administrators. As shown in Table 2, the specific combination of programmatic and process changes, and the timing of the changes, varies by administrator. Also seen in Table 2, some administrators that made changes in the past are planning to make additional changes related to the same topic in the future. For example, Administrator 7 has already altered its programs to accommodate advanced controls and is planning to make additional changes to further accommodate controls in the future. We describe the programmatic, process, and collaboration changes in more detail in the following subsections.

**Table 2: Past and Future Program Changes, by Respondent**

Admin ID	Program				Process			Collaboration
	Add Advanced Controls	Expand or Emphasize Midstream	Focus on Complex Projects	Phase Out Fluorescent	Move Apps. Online	Improved Reporting	Combine Applications	Work with Other Administrators
1	✓							
2	*			✓	*	✓		
3	✓	*				*		
4	✓	✓	*			*		
5		✓	*	✓	✓			
6	*	✓			✓			✓
7	✓ *	✓	*	✓	✓ *	*		✓
8			*	✓	✓ *	*	*	
9		✓ *	*		✓	*		✓
<b>Total</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>6</b>	<b>5</b>	<b>1</b>	<b>3</b>

\* Indicates future or planned change

✓ Indicates past change

### Programmatic Changes

Respondents provided the following elaborations about programmatic changes.

- › **Adopt advanced lighting controls:** Six respondents stated that advanced controls are the future of lighting savings; programs and tools must therefore be developed to emphasize the importance of these new measures.

- › **Enhance or create midstream lighting measures:** Shifting more measures to a midstream program delivery model reduces the time staff spend reviewing program applications. According to the two respondents considering moving to midstream approaches, the administrative time savings can be used to develop methods for determining savings from advanced controls and to promote advanced controls in the marketplace. One respondent reported that moving as many measures as possible to midstream could result in programs that do not need their own lighting tools. Instead, this respondent suggested programs could rely, at least partially, on manufacturers' and distributors' lighting tools. "Our program investment might be better suited [to examining] the interaction of [energy using] systems" and leaving the relatively simple lighting calculations to others.
- › **Focus on complex projects:** According to five respondents, developing systems and tools that can accommodate multiple measures – including measures beyond lighting equipment– will become increasingly important to accounting for program savings. Programs and tools need to capture savings from daylighting – something one respondent said the lighting industry has struggled with in the past – advanced lighting controls (see bullet above), and other energy management systems.
- › **Phase out fluorescents:** Four respondents reported they have reduced or eliminated incentives for fluorescent lighting measures.
- › **Value efficiency by time of day and season:** One respondent noted that as more renewable generation, especially wind power, comes online, the time-value of efficiency will become increasingly important. That is, a kilowatt-hour saved at midnight (off-peak) is not as valuable as a kilowatt-hour saved at 5 P.M. in the summer (during a utility's peak period). Programs, and tools they rely on, will therefore need to consider the time when savings occur in their calculations.

## Process Changes

Respondents also described the following procedural changes they are making to their lighting programs.

- › **Move lighting applications online:** Online processes limit the need for staff to manually enter data for reporting, limit application review time, and can improve the consistency of data entry. Six program administrators have already, and/or will soon be, moving participation processes online. It was not always clear from respondents how long ago they moved processes online.
- › **Create improved reporting mechanisms:** Six respondents stated that improved capacity to investigate trends in program participation and measure uptake will be increasingly important to their identification of program savings. For example, one respondent would like a dashboard of program projects and the ability to better track individual projects over time. The respondent thought such enhanced capabilities would help them see if the projects are meeting their long-term goals. Another respondent that works in multiple states noted that their utility is investing in a Salesforce-based tool to better track and report savings across all jurisdictions.

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- › **Combine application processes:** One respondent hoped to create a single online tool for all lighting measures, where the tool would be agnostic as to whether a measure is prescriptive or custom. The respondent thought such a tool, which is a few years away from coming to fruition, would make participation easier for customers installing both prescriptive and custom measures.

## Program Administrator Coordination

Three respondents talked about program administrators in different areas of the country coordinating on lighting program savings calculations.

- › **National Coordination:** Two respondents, one from the Midwest and one from the East, reported that a subcommittee of the Illuminating Engineering Society (IES) is working on standardizing lighting calculations across jurisdictions. Coordination has proven challenging due to the different regulatory environments in different regions. The committee, formed about one year ago, consists of program administrators, Department of Energy staff, academics, and others. The midwestern respondent also noted past learning from administrators in the Northwest about their lighting program strategies.
- › **Developing tools for multiple jurisdictions:** One respondent reported that their organization has developed and continues to enhance, savings tools and platforms that other administrators can purchase. The organization is developing these tools to reduce the need for other administrators to invest resources in developing and continually updating similar tools.

## Conclusions and Recommendations

**Conclusion 1:** Program administrators across North America are focused on developing new strategies to address the rapidly changing lighting market. Administrators are adapting their programs by taking three key steps. They are:

1. Moving as many measures as possible to program models with lower administrative burdens that are designed to increase broad uptake of measures while decreasing per-project incentives. These models include midstream and simple downstream rebate approaches.
2. Looking for ways to support and drive more complex and comprehensive projects.
3. Collaborating with other lighting program administrators on addressing lighting market changes.

Once their new strategies are established, the administrators intend to develop data management and reporting tools that meet their specific regulatory environments and programmatic needs.

**Recommendation 1:** Before embarking on updates to the tool, Energy Trust Planning and program staff should coordinate about potential changes—including the timing of potential changes--Energy Trust may make to its non-residential lighting programs. Once the team has come to a conclusion about how programs will change, the team should consider the processes

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and tools they will need to best support the new programs in the context of the evolving lighting market.

**Recommendation 2:** Continue to learn and share with other administrators. Other administrators are also wrestling with how to adapt to the changing lighting market. At least one coordinated effort – the Illuminating Engineering Society’s Energy Efficiency Lighting Project Administrators committee – is examining ways to figure out how to address these changes nationally. Communicating with these other administrators can allow Energy Trust to learn about strategies others are taking and allow others to learn from Energy Trust. Coordination could also give Energy Trust the opportunity to participate in the development or enhancement of lighting tools that meet the needs of the increasingly complex lighting market and Energy Trust’s programs.

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## Appendix – Interview Guide

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### Introduction

Name:

Organization:

Date:

Interviewer:

### Email sent by Energy Trust

Hi [PROGRAM ADMINISTRATOR STAFF],

Energy Trust is considering updates to our Lighting Tool in the next few years and we have contracted with the evaluation firm Research Into Action to conduct market research. As part of this research, we would like to get feedback from other utilities and program administrators discussing and/or working on current and potential future lighting tools.

I am e-mailing to ask if you would be willing to participate in this research. [Someone] from Research Into Action will be reaching out to you in the next week or so to schedule an interview, which should take about an hour of your time.

We intend to make the final version of the research report, which will summarize feedback from interviewees, available on our website; we expect this to be complete by the end of Q2 2018.

If you have any questions or concerns, please let me know. Thank you in advance for your time and input for this research.

Thank you,

[ENERGY TRUST RESEARCH LEAD]

### Introduction for Staff at Other Program Administrators

Thanks for taking the time to talk today. As I mentioned in the email I sent <last week>, I work for Research Into Action and we have been asked by Energy Trust to conduct research about lighting tools used by other program administrators to calculate savings and incentives. Energy Trust is examining whether their own lighting tool is sufficiently flexible to support the evolving lighting market, and we are interviewing people from other programs, such as yourself, to understand what characteristics of a new tool would be helpful. Therefore, I will be asking you about the aspects of lighting tools you are familiar with that work well, what needs improvement, and what features you would like to see in a lighting tool.

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I estimate that our talk will take about 45 to 60 minutes.

I'd like to audio record this interview just for my note-taking purposes; it will only be used by Research Into Action staff and will not be provided to Energy Trust. Is it ok that I record the interview?

Do you have any questions before we get started?

## Screening

S1. First, I'd just like to verify that one or more commercial and/or industrial programs that you administer have a lighting tool that contractors/distributors/implementers/other market actors use to calculate savings and incentives for customers. Is that correct?

[SINGLE RESPONSE]

1. Yes
2. No [END INTERVIEW]

## Roles, Responsibilities, and Background

Q1. Let's start with a bit about you. Please tell me your title, and briefly describe your role and responsibilities with your organization.

Q2. How long have you been in your current role? How long have you worked in the lighting industry?

Q3. Can you please describe how your commercial and industrial lighting programs or efforts work? Do the programs rely heavily on contractors/distributors, an implementer, or some other method? *[If needed: Do contractors/distributors use the tool, implementers, someone else?]*

Q4. What programs use the lighting tool? How does use of the tool differ, if at all?

[IF WORK IN MULTIPLE STATES – i.e. Duke, Excel, Eversource, National Grid, and Ameren]

Q5. How does use of the tool differ across the different states your company serves?

Q6. Have you made any recent changes to your commercial and industrial lighting program(s)? If so, what were those changes and why did you make them?

Q7. Are you planning any changes to your commercial and industrial lighting program(s) in the near future? If so, what are those planned changes and what is driving these changes?

## Staff Experience and Use of Lighting Tools

I'd like to ask about your experience with existing lighting tools. As you may know, Energy Trust currently uses an Excel-based lighting tool that contractors and distributors (trade allies) can use to calculate energy savings and incentives. The trade ally enters customer data like hours of operation,

type of lighting to be replaced, and type of lighting to be installed into the tool, and the workbook calculates the savings and incentives.

Q8. Does your program also use a lighting tool that contractors/distributors/others complete?

[ASK IF Q8 = YES]

Q9. If so, please describe the tool. Is it Excel-based, online, something else?

[ASK IF Q8 = YES]

Q10. Who completes the tool? [*If needed: Is it contractors, distributors, someone else? Does it depend, if so, on what does it depend?*]

[ASK IF Q8 = NO]

Q11. If not, using a lighting tool [and not described earlier] please describe how your program determines lighting savings?

[END INTERVIEW]

Q12. How do you, as a program administrator, use the lighting tool, or interact with it, in your current job? [*Probes: energy savings calculations, incentive calculations, reporting, process applications, analyze data coming from the lighting tool, etc.*]

Q13. In a couple of brief sentences, when you think about your lighting tool, what aspects of the tool do you like most? Why?

Q14. In a couple of brief sentences, what aspects of your lighting tool do you find most challenging, limiting, or frustrating? Why do you say that?

Q15. Please describe your understanding of how contractors/ distributors/others use your lighting tool.

Q16. In a couple of brief sentences, what aspects, if any, of your lighting tool do contractors/distributors/others like the most? Why?

Q17. In a couple of brief sentences, what aspects, if any, of your lighting tool do contractors/distributors/others like the least? Why?

Q18. Do contractors/distributors/others ever use their own lighting tools/calculators in place of your lighting tool/calculator? How does this work?

## Tool Platform

Now, I would like to ask about the layout and platform of the tool.

Q19. Just to verify, you indicated that your lighting tool is [Q9 RESPONSE]. Is that correct? [*Probe: Is it online, in Excel, something else?*]

Q20. What drawbacks, if any, are there to having a tool in the platform you are currently using? Please elaborate.

Q21. The current version of Energy Trust's lighting tool is Excel-based. What would you see as the benefits to having a tool in Excel, if any?

What drawbacks are there to having a tool in Excel? Please elaborate.

## Lighting Tool Updates

- Q22. What typically prompts an update to your lighting tool? [*Probes: A change in measures, the need to change incentives, an error that was found, updates to terms and conditions, regular intervals...*]
- Q23. How often is your tool updated?
- What is the process for updating your lighting tool? Who is involved in updates? What is the role of each person or party involved in updates?
- Q24. Do you think the current process for updating the tool works well? Do you think the tool should be updated less frequently or more frequently? Why?
- Q25. Have you found it challenging to ensure all your staff and implementation staff are using the current version of the lighting tool? How so? What do you typically do to resolve this issue?
- Q26. How are contractors and distributors notified about updates or new versions of your lighting tool? Do you think this process works well? Why or why not?
- Q27. Have you experienced any challenges, or do you have any concerns about, contractors and distributors using out-of-date versions of the tool? What version-control challenges have you faced? How, if at all, does this differ between contractors and distributors? How have you handled these challenges?
- Q28. What systemic changes (such as a change in platform or significant overhaul of your existing tool), if any, is your program or utility planning to make to its lighting tool? If changes are being made, why are those changes being made? If there are no changes planned, have changes been discussed, or should changes be discussed? Why?

## Suggestions for New Tool

The next few questions are about your wishes for a lighting tool. Specifically, if you and your program were considering changing your lighting tool, what capabilities would you seek?

- Q29. Is there anything you wish that a new tool would enable you or your program to do? If so, what, and why?
- Q30. First, what capabilities would you most like the new tool to include and why? Capabilities might include the following:
- Ability to easily calculate incentives using multiple factors (quantity, lumen output, time of use) and baseline conditions
  - Ability to extract more data and information than can be extracted from the current tool
  - Ability to integrate with other systems in your program or utility
  - Ability to access the tool online
  - Ability to update measures easily and more often

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- Q31. What platform would you suggest Energy Trust use for its new lighting tool--Excel, online, or something else? Why do you say that? [Probes: How would an alternative platform provide greater flexibility, better reporting capabilities, better integration with Energy Trust's other systems, or otherwise improve the tool?]
- Q32. What changes to the lighting market, if any, do you think should influence the development of a new lighting tool? [Probes: How should those changes affect the new tool? What do you think is the right balance of being able to update measures versus the need to have a tool everyone understands?]
- Q33. How, if at all, is your program incorporating the affects lighting has on energy using equipment and overall energy savings?

## Experience with Other Lighting Tools

Before we conclude, I would like to learn about your experience with other lighting tools.

- Q34. Please describe your use and knowledge of lighting tools from other utilities or programs. How familiar are you with these tools?

[ASK IF KNOWLEDGEABLE ABOUT OTHER TOOLS]

- Q35. What aspects, if any, of lighting tools do you like? Why?

[ASK IF KNOWLEDGEABLE ABOUT OTHER TOOLS]

- Q36. What aspects, if any, of lighting tools do you not like? Why?

[ASK IF KNOWLEDGEABLE ABOUT OTHER TOOLS]

- Q37. Has your program or utility considered using any of the tools you are knowledgeable about? If so, what aspects of the other tools were attractive to your organization?

- Q38. Finally, are there any additional topics or insights about your lighting tool that we haven't discussed that you would like to mention now? Anything that would be valuable to Energy Trust that we have not discussed?

Thanks for your time.