



# Memory Care Pilot Evaluation Final Report

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Portland, Oregon

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# MEMO

**Date:** November 6, 2014  
**To:** Board of Directors  
**From:** Scott Swearingen, Program Manager, Multifamily  
Dan Rubado, Evaluation Project Manager  
**Subject:** Staff Response to the Memory Care Lighting Pilot Evaluation

The memory care lighting pilot was ultimately unsuccessful in spurring lighting upgrades in long-term care facilities wishing to meet new State regulations for memory care communities. As a result, Energy Trust cancelled this offering and handed the lighting templates over to the State office that regulates these facilities as a resource. The program is using the findings from this report to develop a strategy to engage long-term care facilities in the future. In the meantime, long-term care facilities can take advantage of the program's standard incentives for efficient lighting. The pilot and evaluation provided a learning experience and some of the major takeaways that came out of this process are listed below.

The lighting templates were one of the main features of the pilot. Although not effective in encouraging lighting projects that qualified for Energy Trust incentives, the templates were generally well liked and did help trade allies meet the required light levels for memory care in participating sites. One problem with the templates was that the fixtures specified were too limited. In the future, templates like this should be product- and brand-neutral and simply list the recommended specifications, rather than prescribe a particular product or solution. It was difficult for trade allies to substitute less expensive fixtures which may have contributed to the high bid prices that made project uneconomical for customers.

Throughout the pilot, coordination and communication between the many players was difficult. Roles and responsibilities were unclear. For instance, no single person or role was tasked with selling the pilot to customers, so it was not strongly promoted. In the future, having clear roles and responsibilities for staff, including a designated person responsible for selling projects, will ensure better pilot coordination, consistent communication with customers and a more effective initiative. Bringing the trade allies into the pilot earlier in the process would have improved communication and helped get them on board so they could have been more effective partners.

The communications with customers about the available incentives created a lot of confusion and disappointment. In future initiatives, the incentives should be set at the beginning to make the sales pitch easier, even if there is uncertainty about the potential savings and costs. A related issue was that the facilities themselves did not have a strong motivation to upgrade their lighting systems. The lighting template and pilot offering was only valuable to facilities if they were motivated to meet the State memory care regulations. Because the State hasn't provided clear guidelines, communication and enforcement on these regulations, lighting upgrades were a low priority for facilities. This situation could be avoided in the future by working with

regulators to strengthen enforcement or by targeting markets where customers already have a strong motivation to make upgrades.

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## Executive Summary

Energy Trust of Oregon (Energy Trust) designed its Memory Care pilot to encourage assisted living facilities that want state endorsement as memory care communities to make efficient lighting upgrades to meet new state requirements issued by the Oregon Department of Human Services (ODHS). Through the pilot, Energy Trust provided participating facilities with technical assistance (through a lighting designer), financial incentives for energy savings, and a lighting template.

Despite the fact that only one facility completed a lighting project using the lighting template, the pilot did result in important learnings for program staff when working with assisted living facilities. Cadmus produced three memos over the course of the pilot to present the findings and conclusions from different evaluation tasks; this final report integrates those three reports. In addition, Cadmus incorporated findings from the final potential participant that indicated interest, then declined to move forward with the templates.

## Conclusions and Recommendations

### Template Helped Meet Regulation Requirements

The greatest benefit of the template was that it facilitated compliance with Memory Care regulations. The template also minimized the amount of planning needed from the renovation team, and improved their confidence that the project would meet the regulations. Without enforcement of the regulations, however, the facilities have less incentive to use the template.

**Recommendation:** Before launching a similar program in the future, Energy Trust should coordinate with ODHS to understand how regulations will affect facilities, then map its marketing and outreach approach to ODHS's monitoring and compliance procedures.

### Cost of Upgrades was a Major Detractor

While the one facility that completed a retrofit found the template easy to use, the other potential participants balked at the cost of the upgrades recommended using the template. The program implementer identified a series of improvements (see **Lessons Learned**), such as incorporating LEDs, that could make the template more flexible and allow users to identify less costly improvements.

**Recommendation:** Given the slow rate of pilot uptake, Cadmus does not recommend investing further resources into improving the template at this time. Should Energy Trust decide to attempt a similar pilot in the future, it should address these considerations before offering a template to potential participants.

### Clear Communication was Essential

Potential participants either indicated that the incentives were not as high as expected, or that the cost of the project based on the template was too high. As these are relative considerations, it seems that

the costs and incentives did not meet the participants' expectations. Had their expectations been more aligned with the actual program offerings, their reactions might have been different.

**Recommendation:** Before beginning new pilots, Energy Trust should first define the incentive offerings and ensure that all parties interacting with the customer can clearly communicate the program benefits. An informed and motivated party should be the first to present this information to participants, such as Energy Trust implementation staff or a contractor with a strong incentive to see the program succeed.



## Introduction

In 2010, the Oregon Department of Human Services (ODHS) updated the building requirements for assisted living facilities to become state-endorsed as memory care communities. The new requirements include improved lighting standards.

Energy Trust of Oregon (Energy Trust) launched a pilot in 2012 to target memory care facilities (assisted living facilities that specialize in Alzheimer's, dementia, and related illnesses) interested in pursuing state endorsement. With the pilot, Energy Trust wanted to test whether a lighting design template, coupled with financial incentives, could help lighting contractors and facility managers develop projects to meet new light level requirements using energy-efficient lighting products and practices.

The pilot was operated under the umbrella of the Energy Trust Multi-family program. Energy Trust hired a lighting designer, Center of Design for an Aging Society (CDAS), to develop the lighting template and recruit participants. The CDAS also helped lighting contractors apply the template. Evergreen Consulting Group (Evergreen) managed the pilot, including calculating incentives for proposed projects. The pilot was intended to serve three existing care facilities in the Portland General Electric service territory.

There were initially seven program applications, three of which Energy Trust selected to move forward with the pilot. Ultimately, none of those three completed the lighting upgrades and all dropped out. Two additional parties later expressed interest. The first was a facility in Forest Grove that received assistance using the template, but no incentive because it was located outside Energy Trust's service territory. This facility completed a retrofit based on the template, and passed state inspections. The second facility, in Salem, dropped out of the program due to the template proposal being too expensive.

This document incorporates Cadmus' analysis as outlined in three previous memos addressed to the Energy Trust team, in addition to our findings from reviewing emails documenting the experience with the Salem facility and our final conclusions and recommendations.

## Evaluation Approach

Cadmus wrote the original evaluation plan for the Memory Care pilot assuming that two or three facilities would complete a lighting template-specified renovation; we planned to conduct pre- and post-retrofit hours-of-use metering, light level measurements, and facility staff interviews at each participating facility. Once the selected pilot participants dropped out, Energy Trust asked Cadmus to modify the evaluation plan. Accordingly, we performed the following tasks:

- Metering of existing lighting fixtures
- Exit interviews with facility staff and their lighting contractors
- Review of one successful implementation of lighting template outside the program
- Review of program email communication detailing progress and eventual termination of the project at the Salem facility
- Interviews with the Energy Trust program manager (Evergreen Consulting) and the program lighting designer (CDAS)

Through these activities, Cadmus sought to determine why the selected facilities declined to move forward, whether the lighting template was effective, what improvements might make a similar program more effective, and other lessons from the program experience.

### *Metering*

Cadmus logged the hours-of-use for permanently installed light fixtures in 7 living units and one common area at two facilities. These lights are controlled by a manual switch. According to facility staff members, lights in common areas are typically left on 24 hours a day and dimmed in the evenings; therefore the only common area we metered was a dining room that was not on a schedule.

We installed 21 Dent lighting logger meters in rooms where the facility staff allowed us access, leaving them in place for at least one month. Due to malfunctioning, we could not remove data from five meters, and one logger was missing when our staff returned to the site.

### *Exit Interviews*

Cadmus conducted exit interviews with staff members from the three facilities that dropped out and with the three lighting contractors who worked with the selected facilities and had used the lighting design template to specify the proposed projects. At one facility, Cadmus interviewed a staff member who had been involved since the beginning of the Memory Care pilot. At the other two facilities, although there had been staff turnover, we were able to interview staff members who could speak to the decision to drop out of the pilot.

### ***Review of Successful Implementation of Template***

Cadmus interviewed the facility staff and contractor who used the template to upgrade lighting in a Forest Grove area facility. This facility did not receive incentives because it is outside Energy Trust's service territory.

### ***Review of Program Communication Regarding Salem Facility***

Cadmus received a series of email communications between Energy Trust staff and implementer staff related to the progress and ultimate termination of a project for a facility in Salem.

### ***Staff and Implementer Interviews***

Cadmus interviewed two key team members who worked on the Memory Care pilot (the pilot team): an Energy Trust program manager for the commercial and industrial lighting programs and a lighting designer who was the primary implementer of the pilot. The Energy Trust lighting program manager developed incentive offers for each prospective Memory Care lighting renovation project. The lighting designer managed most other aspects of the pilot, including recruitment, template design, and teaching facilities' contractors how to use the template.

### Pilot Design

Energy Trust hired a lighting designer to be the pilot’s main implementation contractor, responsible for recruiting participants, creating the lighting template, and providing guidance on template use to pilot participants and their contractors.

The template contained two main components: a floor plan of the various space types in assisted living facilities and a fixture key. Figure 1 shows a bathroom space and an excerpt from the fixture key. The light fixtures in the room were identified with a set of letters and numbers. For example, to identify what fixture should be installed in location J-3 (over the bathtub/shower), the user would look up fixture type J-3 in the key to see that the template specified a Lithonia Gateway product.

Energy Trust intended for the template to enable lighting contractors to scope an entire memory care facility without needing a lighting designer to ensure the project met required light levels.

**Figure 1. Bathroom Floor Plan and Excerpt of Fixture Key**

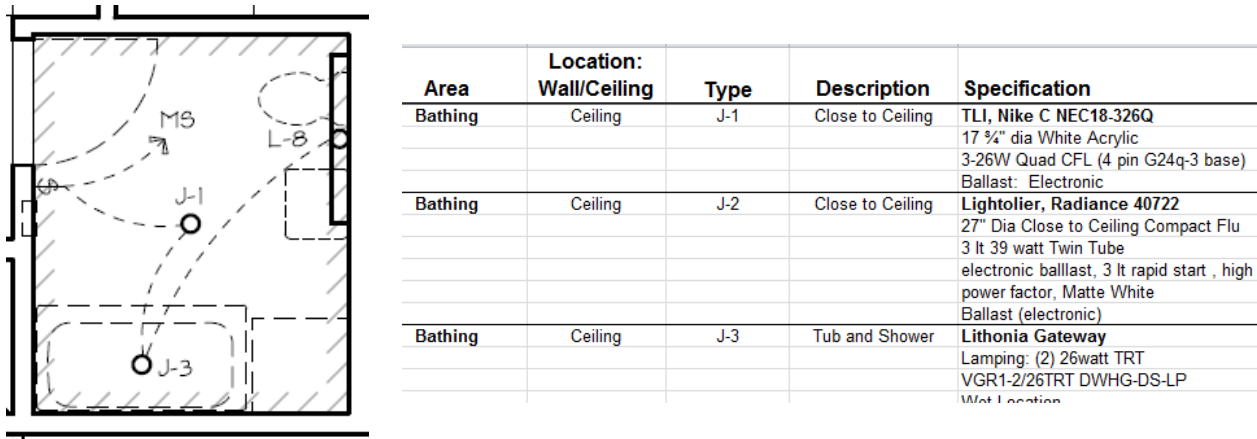


Table 1 shows the estimated installation costs for the first three projects developed using the template. The table also presents the dollar amount of the incentive offered by Energy Trust and the percentage of project costs the incentive would have offset.

**Table 1. Installation Costs and Incentive Amounts**

Project Number	Estimated Installation Cost	Energy Trust Incentive	Incentive Percentage of Total Project Cost
1	\$47,580	\$18,525	39%
2	\$183,662	\$45,405	25%
3	\$59,941	\$11,960	20%

## Pilot Implementation

For several months during 2012, CDAS worked to recruit participants to the program. By November 2012, the Memory Care lighting pilot had received applications from seven facilities, some of which are under the same management company. Energy Trust staff and CDAS chose three facilities to move forward with the pilot based on the facilities' existing light levels, which did not meet the new Oregon regulations for Memory Care, and based on the number of communities under each management company. It is important to note that the facilities were not required to upgrade their lighting to meet the new code, as their Memory Care status was grandfathered.

The pilot implementer, CDAS, said the informational flyer that it developed with Energy Trust was the key method used to market the pilot. The implementer said they did not contact care facilities directly; instead, they contacted local architects and relevant industry organizations (for instance, senior care trade groups), who sent pilot announcements to its members.

Interested facilities then completed a questionnaire and submitted the form to the implementer. Then the implementer conducted a site visit at each prospective facility to examine the existing lighting levels. Based on these screening steps, Energy Trust and the implementer invited three participants to join the pilot in 2013.

At the beginning of the pilot, the incentive levels were still under development. The CDAS reported that this meant they could not provide the facilities with accurate details about the level of financial support they would receive, which ultimately led to some participants misunderstanding the amount of financial incentive they should expect. Energy Trust eventually adopted the rebate structure it had proposed in March of 2012.

CDAS then worked with staff at each facility and with those facilities' electrical contractors, explaining the requirement to follow the lighting template where possible. Next, the contractors determined the project costs using the lighting template and calling upon the implementer for technical assistance, as needed. Evergreen helped the contractors complete the lighting incentive form to determine the incentive amount for the renovation. When the contractors received the approved incentive offering, they forwarded that information to the facilities, along with the project scope of work and cost. Ultimately, all three of the original facilities dropped out of the pilot after learning of the project cost and the size of the incentive relative to the cost. Two facilities later expressed interest – one in Forest Grove and another in Salem.

### *Forest Grove Project*

This facility is outside Energy Trust territory. However, facility staff wanted to meet state of Oregon regulations so that part of their facility could be designated as a Memory Care community. They expressed interest in using the lighting template to accomplish this. CDAS provided the facility with the template and supported its use, but Energy Trust did not provide incentives. The facility successfully completed an upgrade project using the template, and passed the state inspection for endorsement.

### *Salem Project*

The Salem facility was particularly promising because it had recently attempted a renovation in order to be designated a Memory Care community, but was found to be noncompliant; it had failed the state inspection and had to remove newly installed fixtures.

While the facility management initially expressed interest in the program, they failed to move forward. Despite the program implementer repeatedly contacting them and offering assistance, neither the facility nor its contractor was willing to engage with the program. The owner was planning to move forward with lighting renovations on their own (not through the pilot) when the pilot ended.

## Findings

### *Hours-of-Use Analysis*

Cadmus was able to place meters in two facilities for an abbreviated period of time before those facilities dropped out of the program. Cadmus used the metering results to create a profile of lighting hours-of-use by room type, presented below.

Table 2 shows the average hours-of-use by room type and number of meters analyzed. Cadmus observed that bathroom lights were left on in many of the units, and that the bathrooms lack windows, which is consistent with the relatively high hours-of-use observed in this space.

**Table 2. Lighting Hours-of-Use by Space Type**

Space Type	Space	Average Hours-of-Use per Day	Number of Meters
Common	Dining Room	5.1	1
In-Unit	Bathroom	7.7	3
	Sink/Vanity	2.3	1
	Bedroom	4.0	7
	Entry Room	6.7	3

### *Exit Interviews with the Original Three Facilities*

Cadmus interviewed facility staff at each of the original three organizations chosen to move forward with the pilot. The following sections present the findings from these interviews.

#### **Facility Managers/Administrators**

At one facility, Cadmus interviewed a staff member who had been involved since the beginning of the Memory Care pilot. At the other two facilities there had been staff turnover, but we were able to interview staff members who could speak to the decision to drop out of the pilot.

#### **Facility Reasons for Dropping Out of the Pilot**

Respondents provided a number of reasons why they decided to drop out of the program, as outlined in the following sections.

#### **No Motivation to Renovate Lights**

Overall, the facilities had no strong motivation to change their lights. The facilities had indicated interest in a lighting renovation that would trigger the new regulations. However, all three properties were already designated as memory care communities at the time Energy Trust selected them to participate in the pilot; this meant they were grandfathered in and not required to upgrade their lighting to meet the Oregon Administrative Rules 411-057-0170 requirements.

In addition, staff at two of the three facilities said the existing lights were fine and energy efficient.

### **No Strong Barrier to Hiring Lighting Designer**

Energy Trust staff assumed that one of the benefits of the lighting template would be to eliminate the need for a lighting designer to ensure that lighting requirements would be met. However, the facility staff members said that technical information was not a barrier to meeting those requirements, and they had in-house specialists. Two facility managers said they would be open to hiring a lighting designer to specify specialty fixtures, such as chandeliers, if such services were included in a turnkey bid or were affordable.

### **Out-of-Pocket Costs Were Too High**

Staff at all three facilities said the primary reason they declined to implement the lighting renovation project through the Memory Care pilot was that out-of-pocket costs were too high, and the Energy Trust incentive was too small compared to total project costs.

One staff member did not understand what was driving the high cost of the bid. Another was unsure if the bid was reasonably priced since there was no other bid(s) for comparison, but said the fixtures were expensive and the scope very labor intensive. The third facility respondent said the template-specified renovation required extensive rewiring of the building to support bi-level dimming, expensive fixtures, and an overall increase in the number of fixtures. This respondent thought these additional fixtures would lead to a higher electric bill, which was a further disincentive to implement the proposed renovation.

### **Miscommunication with Pilot Staff**

All facility staff Cadmus interviewed said the out-of-pocket cost of the template-specified projects came as a surprise. The two staff members who joined their respective facilities after the pilot was underway did not know whether there had been any discussion of costs with other facility staff before they saw the quote.

The facility staff member who was involved from the beginning of the pilot said communication with the pilot implementer, CDAS, was not clear or timely. This staff member explained that, at the beginning, the pilot implementer said the “majority” of costs would be covered by the incentive, and the facility staff assumed that “majority” meant 60% to 80%. (As shown above in Table 1, 20% to 39% of total project costs would have been covered by pilot incentives.) This facility staff also said the pilot delayed the facility’s planned construction project. It took six to seven weeks to find out the facility was approved for the pilot, then they received no communication aside from Cadmus’ visit to meter the lights. The facility staff reported that they called the pilot implementer to explain they were not moving forward with the project, and two months later the pilot implementer called back to ask when its renovation would begin.

Cadmus also interviewed CDAS, which reported that it was difficult to identify the right contact at each facility. Often, they had to navigate between various decision-makers for a single facility. If the pilot was not a priority for the facility, this process was all the more time-consuming. Evergreen, the program manager, reported they did not interact directly with the facility staff.



### *Other Facility Staff Insights*

Additional comments from facility staff are outlined below.

#### **Lighting Template**

Facility staff members did not work directly with the lighting template and knew little about it. They said the contractors would have more feedback about its use.

#### **Benefits of Pilot Experience**

One facility staff member said he learned a lot about lighting quality from working with the template and the implementer. He said the lighting designer identified specific ways to improve the quality of the lighting, such as by making the transition area lighting more diffuse, which would not be obvious to a layperson.

#### **Recommendations from Facility Staff**

When asked to provide feedback on how Energy Trust could improve the pilot, all facility staff members said the recommended projects needed to be more affordable. Two said that better communication about costs at the beginning of the projects might have prevented them from obtaining then not accepting the pilot bid. Other recommendations were to:

- Provide multiple bids to assure decision-makers that the costs are reasonable
- Communicate earlier about the costs to treat each type of facility space
- Offer smaller, more affordable projects
- Provide multiple options to facility instead of all or nothing, and relate each option to the level of need/severity of the issue to be corrected
- Incorporate more and cheaper fixture options into the template (this will also help make projects more affordable)

Facility staff said facilities that are motivated to upgrade (either forced to upgrade for compliance or those with customer complaints about the lighting) will appreciate any financial incentive.

### *Facility Measure Installation Outcomes*

One facility was in the process of planning a renovation (new paint, flooring, and lights) at the time it was approached to participate. Although this facility dropped out of the pilot, it completed a lighting renovation and received Energy Trust incentives outside the pilot.

The other two facilities also had further involvement with Energy Trust beyond the Memory Care pilot. Staff members said that after their facility dropped out of the pilot, an Energy Trust staff member visited the facility and provided low-cost tips and free aerators and showerheads.

#### **Lighting Contractors**

All of the lighting contractors who were involved with the pilot are Energy Trust trade allies, and two already had a relationship with the prospective memory care facilities. Energy Trust recruited the third

trade ally for the pilot. None had previously used a lighting design template for interior spaces.<sup>1</sup> They also did not know about the lighting requirements in the memory care community Oregon Administrative Rules prior to their involvement with the pilot, even though they regularly deal with lighting requirements specified in building codes.

The pilot implementation contractor met with the three lighting contractors and explained how to use the lighting template. Two contractors said they worked closely with the pilot implementer or another Energy Trust support person, either to specify a project or to complete the Energy Trust lighting spreadsheet.

One contractor noted that the facility he was working with had high resident satisfaction and lacked motivation to renovate the lights. This contractor said he knew the project would not work out, but he stuck with the pilot for the experience of working with the pilot.<sup>2</sup> He said he communicated his concerns to the pilot implementer, but did not receive any response.

Another contractor said he did not have a sense of the facility's budget when developing the project, and he did not think cost would be the barrier it turned out to be. The facility staff later shared that they hoped for a \$75,000 to \$80,000 project with 50% covered by incentives. However, because the project estimate was significantly more expensive, at \$183,662, and with only a 25% incentive, the facility staff cancelled all scheduled meetings to further discuss the project.

The third contractor reworked the bid without using the lighting template. The resulting project used less expensive fixtures, and so was cheaper overall but still met the Memory Care standards, and the facility ultimately completed the lighting retrofits.

### *Standard Practices for Scoping a Lighting Renovation*

When asked about how they scope a lighting renovation, the contractors said that clients will either have a design in mind or they hire a lighting designer to create the project plan. They then approach the contractor to obtain a bid for the proposed project. The contractors do not usually hire a lighting designer, although some clients have in-house design staff. One contractor said his firm uses a Lithonia lighting analysis tool called Visual to assist with the project specification process.

### *Value of the Lighting Template*

All three contractors said the lighting template was easy to use and provided a good start, but it did not remove the need to have someone review the overall project and ensure it made sense. Two contractors said the template did not reduce the amount of time or effort needed; the third said the

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<sup>1</sup> One contractor said he has experience with templates for relighting parking lots.

<sup>2</sup> This contractor further elaborated that, in general, prospective customers perceive an estimate to be free, but that actual estimates represented approximately 35% of the company's overhead. However, he said that if more than 20% of a contractors' bids are accepted, then the company is not charging enough and not making money.

template reduced the time needed to specify the project by 25%, because even where substitutions had to be made, the template made it easier to find a substitution that met the required light levels.

Two contractors said that using the template made them confident that the specified project would meet the required lighting levels, with one of these contractors saying the template removed the need to hire a lighting designer. The third contractor was more confident in meeting the regulations after working closely with the pilot implementer, who is a lighting designer.

All three contractors were willing to try the template again. The contractors stated that the template was appropriate for memory care facilities, but may not be appropriate for restaurants or other industries where lighting needs varied much more.

### *Causes for Deviations from the Lighting Template*

The main reasons contractors said they deviated from the template were:

- The template assumes a 9-foot ceiling height, but taller ceilings require greater light output per fixture or more fixtures
- Facility aesthetic preferences
- Product availability
- Dimming fixtures require rewiring, which can be expensive (one contractor worked with the implementer to find an alternative approach to the dimming fixtures)

### *Ways to Improve Template*

Two contractors offered advice for improving the lighting template. Both suggested incorporating greater consideration of fixture costs or offering multiple price points for basic, premium, or luxury lighting projects. One said that by adding in price estimates, the template would be more useful as a decision-making tool, which could help generate more customer interest.

However, these two contractors noted that adding in average costs per square foot for each space type would be difficult because cost depends on existing conditions. They also admitted that it is difficult to capture what changes are needed to increase lighting quality, rather than just reaching the required light levels.

### *Findings from the Forest Grove Facility*

A facility in Forest Grove, which expressed interest after the original three facilities dropped out and was not located within Energy Trust territory, did complete a lighting upgrade using the template and successfully passed the state inspection. Cadmus staff interviewed the project's lighting designer and design-build contractor on their experiences using the template. The findings presented in this section are based on those interviews.

CDAS initially thought that the facility was within Energy Trust's service territory and sent the facility the lighting templates and fixture specifications. Later on, CDAS discovered the facility did not qualify for

pilot incentives. Regardless, the facility continued with the Memory Care conversion using the template. The facility management's biggest concern was to minimize disruption to the residents, which meant completing the renovation quickly and meeting memory care light-level requirements on the first try.

### About the Forest Grove Facility

Built in 1989, this 140-unit facility was dated. Occupancy rates were high, but the facility staff needed to send residents who developed dementia to other facilities for memory care services. Facility staff hired a design-build contractor to oversee the facility renovation, which is being completed in phases. Due to the demand for memory care facilities, the contractor first converted 10 to 14 units into a memory care wing, updating both the lighting and interior finishes.

### Feedback about the Lighting Template

The lighting designer and design-build contractor had the following positive remarks about the lighting template:

- The template fit the building well and “couldn’t have been easier [to use].”
- “I picked it up and used it right away.”
- It made it easy to comply with Oregon regulations; “there was no guessing about it.”
- “I learned a lot through the templates about the [memory care] regulations.”
- “The templates were a blessing.”
- “It [the template] was a success. We followed the template for each space type and got the light levels just right.”

The designer and contractor were so satisfied with the template that neither was able to offer recommendations for improvement.

When asked to elaborate on how the template was used to facilitate the project, the designer said the lighting template showed the required light output levels for each space type and specified the exact type of fixture and number of fixtures that would meet the required levels. Using the template as a roadmap allowed the designer to reduce the time needed to develop a project specification. It also led to a positive collaboration experience for the renovation team, as it minimized the amount of revisions needed.

The designer estimated that the lighting contractor only had to substitute 10% of the fixtures specified in the template. The one time the renovation team had to deviate from the template to add a light in the shower area of the bathroom, it was able to quickly find another fixture with similar specifications.

The design-build contractor offered additional insights into the process of using the template. He said his team used the template in conjunction with photometric drawings that showed lighting intensities with the proposed fixtures, producing those photometric drawings using a lighting manufacturer's modeling software. The combination of the template and the drawings gave the contractor confidence that the resulting light levels would meet memory care regulations. The presence of a professional

electrical contractor on site further increased his confidence that the project would be successful. According to this contractor, the template was helpful because it provided an example of a successful project. Although he was not sure how much time it saved the team, he said the template was used to enhance their original design for the facility.

### Lighting Renovation Results

Due to careful planning by the lighting renovation team, the completed project met the memory care requirements at the first inspection. In addition, the designer said the fixtures specified in the template were attractive and the environment was brighter without any glare. Both the designer and contractor said the project cost was reasonable. Cadmus did not have information about whether the project received incentives from Forest Grove Light and Power. The designer said the combination of upgraded lights and new carpet resulted in better contrast for residents, who appeared to be happy with their environment.

As the contractor continues to renovate non-memory care areas of the facility, he plans to apply the template.

When asked about other industries that would benefit from a template approach, the contractor thought medical or dental offices may be good potential applications. Elaborating, the contractor said a template approach would work well for any type of building with repetitive, similar room and space types.

### *Findings from the Salem Facility*

In spring of 2014, staff from a facility in Salem indicated they were interested in participating in the pilot. The program manager, Evergreen, copied Cadmus on a series of Salem facility status updates over the summer and fall of 2014.

CDAS, the implementer, provided facility staff and their contractor with the template and guidance on its use. The facility's contractor supplied Energy Trust with a proposal based on the template, and the Evergreen then calculated an estimated incentive. This facility did not expect the incentive to be the 'majority' of the project cost, as other facility managers had. Nevertheless, the facility staff said the incentive was not enough to justify using the template, and requested a proposal based on their contractor's standard approach that would still satisfy the Oregon State requirements for memory care communities.

The implementer did inform the facility and the contractor that Energy Trust was able to provide multi-family program incentives for the standard proposal, even if they didn't participate in the pilot; they attempted to reach the facility owner and the contractor several times, but received limited response.

Eventually, the contractor informed the program implementer that the facility had chosen not to participate in the program at all because the quoted incentive was too low, and they did not want to use the template. Neither the facility owner nor the contractor acknowledged that they could access

standard incentives for efficient lighting retrofits without using the template. However, at that point, Energy Trust had decided there was too little interest to continue the pilot program.

At the time the pilot was terminated, the facility owner was planning to move forward with a lighting upgrade based on the contractor's standard lighting upgrade proposal.

### ***Pilot Staff and Implementer Interviews***

#### **Pilot Benefits and Accomplishments**

According to CDAS, the pilot's main benefits were: (1) program staff worked with the facility's existing lighting contractor, which most facilities prefer, and (2) the template provided the facilities and their lighting contractors with a tangible plan for the lighting upgrade, along with options for each room.

Furthermore, the implementer reported that the pilot helped improve the memory care renovation review process through its work with ODHS, the agency responsible for reviewing compliance with the memory care regulations. The implementer suggested that ODHS request photometric or lighting calculations from each facility during the planning stage, in order to help catch mistakes before a project is installed and the state inspection occurs. ODHS concurred and adopted this approach. The implementer says this will help care facilities improve their compliance rates and ensure the success of future renovations.

#### **Lessons Learned**

##### ***Customer Motivations***

According to the pilot team, facilities are primarily motivated to upgrade lighting by customer complaints that the space is too dark, financial incentives, and the need to comply with regulations. Based on our evaluation research findings, the need to comply with regulations was the strongest motivator; facilities that did not need to upgrade their lights to comply did not prioritize the lighting upgrade.

The lighting program manager observed that facilities that were already endorsed by the state of Oregon were either grandfathered in or experienced very little pressure to upgrade. One Energy Trust staff member noted that ODHS does not have a system in place to track code compliance, or to issue fines for non-compliance.

##### ***Customer Engagement Approaches***

One challenge the implementer experienced was finding the right person at each facility to engage at the beginning of outreach efforts. Often, multiple decision-makers were involved that would each need to approve the project. Because it can be time consuming to determine the main decision-maker(s) at each facility, the implementer suggested targeting companies that own/manage multiple properties to maximize the number of retrofits that could be accomplished.

Many other staff recommended that the program manager and implementer be present when a contractor presents a template-based proposal to a participant. The program representatives can highlight the program benefits, including energy savings, improved resident comfort, and ease of compliance with the state regulations. The program implementer can also respond to any lighting-related questions from either the contractor or the participant.

### *Marketing*

CDAS said that having a larger area for recruitment, beyond Portland General Electric service territory, would have resulted in a better set of potential projects. They also said that if the pilot is offered again, they will try marketing it through presentations and booths at trade conferences,<sup>3</sup> since these events present an opportunity to educate facilities about the importance of energy efficiency and adequate lighting levels for seniors and people with dementia. In addition, in the future they will prioritize facilities seeking to become memory care properties or that are completing significant remodels that trigger the need to comply with the regulations.

The implementer also noted that because they were not able to give potential participants a good idea of the incentive level from the start, several were disappointed with the proposal. Having these details in place before reaching out to participants, and having available marketing materials that clearly present the program benefits, including the incentives, is critical to managing participant expectations. These materials should also clearly outline the steps to participate.

Finally, the implementer recommended that if successful memory care projects are completed in the future, Energy Trust should develop case studies for them, since case studies are an effective marketing tactic for the target audiences.

### *Lighting Template*

The implementer created the lighting template in 2010, before LED technology had advanced sufficiently to be a feasible solution for most facilities. Now that LEDs have improved significantly, she plans to update the template to include LED fixture options.

The implementer and lighting program manager said the lighting template worked well for the assisted living facilities, citing only a few situations where they heard about contractors making substitutions to lighting outlined in the template.<sup>4</sup> Regardless, the implementer would like to increase the number of fixture options included in the template to appeal to different aesthetic preferences. Since cost was an issue for most of the potential participants, the implementer hopes the template can be expanded to include less expensive options that still meet the state criteria.

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<sup>3</sup> Two major care associations hold multiple conferences: LeadingAge and Oregon Health Care Association.

<sup>4</sup> In one case, the facility ceiling height differed from what was specified in the template, so the implementer conducted a custom calculation to determine how much lighting was required in the space.

### *Integrating the Template into Energy Trust Program Offerings*

One of the respondents suggested that the Memory Care pilot design does not work well within an existing building retrofit program, because such programs are usually designed for one-for-one replacement and do not trigger code compliance. In contrast, this pilot requires a complete redesign of the space, which triggers compliance with code and Memory Care light level regulations. This respondent thought the pilot would be better classified as a new construction or extensive remodel program. (Energy Trust staff pointed out the renovation may not necessarily require code inspections. The existing Buildings program recognizes lighting retrofits that include new p=fixtures and placement, but are not considered a major renovation).

This same respondent further stated that retrofit contractors may not be as familiar with building codes as new construction contractors, which could have led to difficulties in implementing the pilot. She said that when working with the contractors, she found that many were not used to looking at lighting plans because of their focus on one-for-one replacements rather than on efficiently meeting required lighting levels. These contractors had to rely on the pilot implementer to teach them how to use the template.



## Conclusions and Recommendations

Based on the findings presented above, Cadmus has developed the following conclusions about the pilot effort, and recommendations for improving the program design should the pilot be adopted as a program.

### Template Helped Meet Regulation Requirements

The greatest benefit of the templates was that they facilitated compliance with memory care regulations. The templates also minimized the amount of planning needed from the renovation team, and improved their confidence that the project would meet the regulations. Without enforcement of the regulations, however, the facilities have less incentive to use the templates.

**Recommendation:** Before launching a similar program in the future, Energy Trust should coordinate with ODHS to understand how regulations will affect facilities, then map its marketing and outreach approach to ODHS's monitoring and compliance procedures.

### Cost of Upgrades was a Major Detractor

While the one facility that completed a retrofit found the template easy to use, the other potential participants balked at the cost of the upgrades recommended using the template. The program implementer identified a series of improvements (see **Lessons Learned**), such as incorporating LEDs, that could make the template more flexible and allow users to identify less costly improvements.

**Recommendation:** Given the slow rate of pilot uptake, Cadmus does not recommend investing further resources into improving the template at this time. Should Energy Trust decide to attempt a similar pilot in the future, it should address these considerations before offering a template to potential participants.

### Clear Communication was Essential

Potential participants either indicated that the incentives were not as high as expected, or that the cost of the project based on the template was too high. As these are relative considerations, it seems that the costs and incentives did not meet the participants' expectations. Had their expectations been more aligned with the actual program offerings, their reactions might have been different.

**Recommendation:** Before beginning new pilots, Energy Trust should first define the incentive offerings and ensure that all parties interacting with the customer can clearly communicate the program benefits. An informed and motivated party should be the first to present this information to participants, such as Energy Trust implementation staff or a contractor with a strong incentive to see the program succeed.