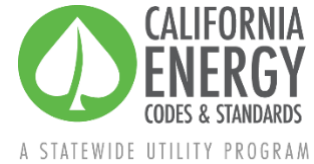


Meeting Notes: March 19 AM, 2026



Posted April 9, 2026

These notes summarize the content from the 2028 Title 24, Part 6 Code Cycle Utility-Sponsored Stakeholder Meeting on **Indoor Lighting and Lighting Controls**

If you are interested in providing input on any of the topics covered in this meeting, please email your comments to info@title24stakeholders.com by May 7, 2026. Comments received after then may not be incorporated into the final version of the CASE Report.

Quick Links

- [Key Points from Meeting](#) – Read through highlights from each measure and review feedback requested from stakeholders.
- [In-Meeting Questions / Comments](#) – Navigate directly to questions asked during the meeting and responses from CASE Authors
- [Zoom Polls & Responses](#) – Review the Poll Questions asked during the meeting and see the responses from stakeholders.
- [Meeting Materials](#) (available on Title24Stakeholders.com) – Review slides, measure summaries, proposed code language and more on our website.

Meeting Information

Meeting Date: 3/19/2026

Meeting Time: 9:00 am – 11:00 pm

Meeting Host: California Statewide Utility Codes and Standards Team

Meeting Agenda

| Time | Topic | Presenter |
|----------|--------------------------|---|
| 9:00 AM | Introduction | Cosimina Panetti, Payam Bozorgchami, Kelly Cunningham |
| 9:15 AM | Indoor Lighting LPD | Jon McHugh, Nicole Hathaway |
| 10:15 AM | Indoor Lighting Controls | Yao-Jung Wen |
| 11:00 AM | Conclusion / Wrap-up | Cosimina Panetti |

Members of the CASE Team

1.1.1 Statewide Utility Codes and Standards Team – Utility Staff

| Name | Email Address | Affiliation |
|------------------|--|-------------|
| Kelly Cunningham | kelly.cunningham@pge.com | PG&E |
| Mark Alatorre | mark.alatorre@pge.com | PG&E |
| Thomas Mertens | thomas.mertens@pge.com | PG&E |
| Jeremy Reeve | JMReeve@sdge.com | SDG&E |
| Dom Michaud | dmichaud@sdge.com | SDG&E |
| Randall Higa | Randall.Higa@sce.com | SCE |

1.1.2 Statewide Utility Codes and Standards Team – Codes and Standards Enhancement (CASE) Team Members

| Name | Email Address | Affiliation |
|--------------------|--|--------------------------------|
| Cosimina Panetti | cpanetti@energy-solution.com | Energy Solutions |
| Heidi Werner | hwerner@energy-solution.com | Energy Solutions |
| Nikki Westfall | nwestfall@energy-solution.com | Energy Solutions |
| Chris Uraine | curaine@energy-solution.com | Energy Solutions |
| Remy Hutheesing | rhutheesing@energy-solution.com | Energy Solutions |
| Jon McHugh | jon@mchughenergy.com | McHugh Energy Consultants, Inc |
| Nicole Hathaway | nhathaway@westmonroe.com | West Monroe |
| Yao-Jung Wen | ywen@energy-solution.com | Energy Solutions |
| Bernie Bauer | admin@integratedlightingconcepts.onmicrosoft.com | Integrated Lighting Concepts |
| Lucy Albin | LAlbin@trccompanies.com | TRC |
| Michael Mutmanskym | MMutmanskym@trccompanies.com | TRC |

California Energy Commission

Contact for 2028 Code Cycle:

Any questions for the CEC can be sent to: EnergyCodeUpdateInquiries@energy.ca.gov

CEC Docket

Comments on the 2028 Energy Code update can be formally submitted to the docket: <https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=25-BSTD-03>

Key Points from Meeting

The purpose and benefits of each measure presented at this meeting are noted below. Specific topics we are looking for feedback on are highlighted.

To provide input, email the CASE Authors noted above or send to info@title24stakeholders.com.

Lighting Power Density

- **Purpose:**
 - Update the maximum indoor lighting power density allowance to reflect advancements in LED technology and align the design factor assumptions with industry practice
 - Clarify the determination of installed wattage for modern lighting technologies including:
 - field-adjustable LED luminaires and lamps
 - luminaires containing programmable drivers
 - tubular LED alteration options (UL type A, B and C)
 - broader use of current limiters to allow credit for less than maximum power in variable output and modular lighting systems
 - Simplify indoor lighting one-to-one luminaire alteration pathway
- **Benefits:** Save energy, save money through energy bill cost savings, and reduce pollution associated with energy generation and resource extraction and increase design flexibility.
- **Feedback requested:**
 - What is your estimate of LED luminaire efficacy increase over the last six years, as a percentage?
 - What applications are challenging to design within the 2022 Energy Code allowed LPD?
 - Are any of the proposed 2028 lighting power densities too high or too low? Which ones and what do you recommend as better values?

- How could the calculation of installed wattage or allowed wattage to be simplified while retaining overall stringency?
- Should the revised code allow the calculated luminaire wattage of luminaires with line voltage sockets to be the total wattage of the installed lamps without requiring a luminaire wattage label?
- Should the defined wattage based on the current limiter maximum wattage be expanded to more lighting system types?
- What fraction of lighting retrofits today end up replacing the entire luminaire because they are not allowed to get credit for lower wattage lamps based on current 130.0(c) definitions?
- With the advent of programmable drivers, the wattage of drivers can be adjusted not only by the manufacturer but also by other manufacturer approved representatives, such as distributors. How should the maximum wattage be documented for verification during the compliance process?
 - a. a. Permanent label installed by manufacturer or manufacturer approved representative (to be verified by field inspector compared to NRCI form)
 - b. b. Document that certifies the maximum wattage of the luminaire as programmed (to be verified by plans examiner compared to NRCC form)
 - c. c. Both label and document

Indoor Lighting Controls

- **Purpose:** Update the mandatory lighting controls requirements to align with industry best practice, better reflect the current technologies, and clarify the intent of the code requirements.
- **Benefits:**
 - Align with industry-recommended best practices.
 - Generate additional energy savings through more effective lighting controls.
 - Increase alignment with national standard (ASHRAE 90.1) and model codes (e.g., IECC).
 - Improve compliance with clearer code language and requirement structures.

- **Feedback requested:** Data on the material and labor (installation, commissioning, maintenance, and acceptance testing) costs, assumptions of spaces that may be impacted statewide, and material data that can help improve the energy and cost analyses. Additional measure-specific requests are listed in the following bullet points:
 - Parking Garage Daylight Adaptation Zones Nighttime Controls
 - a. How big is the daylight adaptation zone? For example, what percentage of daylight adaptation zones is typically within the entire parking structure, and does the daylight adaptation zone lighting cover both sides in a two-way entrance/exit?
 - b. How frequently is daylight adaptation zone lighting controlled with daylight adaptation controls which dims or turns off daylight adaptation zone lighting during daytime? Do you specify or sell these controls?
 - c. What percentage of commercial buildings in dense urban areas feature integrated parking garages?
 - Require Occupant Sensing Controls in more Spaces
 - a. Cost of HVAC integration for occupied standby controls
 - b. Additional efforts (design, coordination, commissioning, and testing) required due to occupied standby controls.
 - Update Multilevel Lighting Controls Requirements
 - a. Feedback on switching from an LPD-based trigger to a wattage-based trigger
 - b. Feedback on allowing the use of scene control to comply with the manual dimmer requirement

In-Meeting Questions / Comments

During the meeting, questions and comments were submitted in the Q&A pane in Zoom as well as asked aloud. Answers are provided below.

Attendees were also asked to respond to polls. Navigate directly to the **[Zoom Polls & Responses](#)** by clicking the link.

Due to time limitations, not all written questions and comments were discussed during the meeting, but all have responses available in these meeting notes.

Lighting Power Density, Jon McHugh and Nicole Hathaway

1. **Question asked via Zoom question pane by Drew Felker:** 30 Years seems too long. Most systems are replaced before then.
 - a. Bernie Bauer: Drew, thank you for your comment. We'd like to discuss further with you.
 - b. Drew Felker: Happy to chat! I am passionate about reducing energy use in the most efficient ways possible
 - c. Chris Uraine: Thanks for being willing to chat with the team Drew. I'm including emails for Jon McHugh (info@mchughenergy.com) and Nicole Hathaway (nhathaway@westmonroe.com). Please copy: info@title24stakeholders.com
2. **Question asked via Zoom question pane by Drew Felker:** Comment on Fixtures For UL Type A. I think we should use the installed lamp wattage. People aren't usually going to buy lamps and then get new ones.
 - a. Nicole Hathaway: Thank you for your feedback! We will reach out via email to discuss this in more detail.
3. **Question asked Verbally by Drew Felker:** On cost effectiveness of lighting fixtures, there are a lot of hidden costs when doing these projects. There's an entire start to finish cost that's baked into doing energy efficiency. It covers architects doing calculations, as well as the design work. Labor is essentially the same based on fixture wattage. Should figure out a way to get a process that gets the full cost. The actual cost of the unit isn't what you actually get. It's like 50% higher when you account for everything. Should do project cost on aggregate divided by the number of units. We need to figure out a way to include those costs so models are more accurate.

Should take a sampling of jobs and see where the wattages are. People don't usually mess with lights once they've gone in the ceiling. Should look at how people are using the systems in the field and what the actual costs are

 - a. Jon McHugh: For our analysis we used the incremental costs. We were trying to isolate the differences. What does a different LPD do to the project cost. The other areas you are discussing should be similar on both sides. The thing that changes is the equipment cost. Labor cost doesn't really change. We are looking at ways to streamline compliance. Nothing so far that describes a reduction in cost.

On the multi-wattage luminaire issue, we've asked a number of stakeholders and are looking for more data on this. In general, many of the market participants weren't asking for an adjustment based on what people actually set the level of those fixtures to. The LPD report discusses addressing projects where there are multiple wattage luminaires. The current compliance process allows for a lower or medium light output that you can get credit for. There's an expansion for the use.
 - b. Drew Felker: Lots of people don't pull permits. If looking just at the incremental cost, it's the cost of not pulling a permit vs pulling the permit. Driving people away from driving efficiency if there isn't an economic benefit. If the codes are too complex or too difficult then we won't be able to address reducing GHG emissions. People who answer questionnaires are not typically the end users.

Can figure out the real world values vs the values we believe. What is actually happening on the ground vs what is happening in the code

4. **Question asked via Zoom question pane by Michael Jouaneh:** Wonder if the threshold should be 2000 watts, for demand response we went from 10000 sf to 4000 watts, so if we go from 5000 sf, the equivalent wattage would be 2000.
 - a. Nicole Hathaway: Thank you for your feedback! The 3,000-watt threshold in the proposal is derived from typical legacy lighting conditions. Assuming a legacy lighting power density of approximately one watt per square foot, a 5,000-ft² space would have approximately 5,000 watts of installed lighting. A 40 percent reduction results in approximately 3,000 watts of post-alteration lighting load. Anecdotally, this corresponds roughly to a retrofit involving about 100 luminaires at 30 watts each. I will follow up to discuss alternate approaches for consideration in the Final Report.
5. **Question asked via Zoom question pane by Drew Felker:** I think the threshold should be based on real world testing of how much energy is saved on average. There are very few buildings using demand response after the systems have been installed, so the \$/W of actual saved energy is near infinity.

So, I would recommend 1. Eliminate Demand Response Requirements for Plug load controllers. 2. Do a study on real use of demand response, or move demand response back to 10K square feet or >4000W of >0.5W/sqft.

 - a. Nicole Hathaway: Thank you for your feedback! We will reach out via email to discuss this in more detail.

Indoor Lighting Controls, Yao-Jung Wen

1. **Question asked via Zoom question pane by Drew Felker:** Laboratory seems like they shouldn't be required. It's difficult to get lab spaces to function right, and light stability is important for many measurements.
 - a. Nicole Hathaway: Thank you for the feedback! We will take this into consideration for the Final Report analysis and reach out via email to discuss further. Importantly, if lab spaces are included, it would only address general lighting (not touching task lighting or experiment-specific lighting) and it would only have to implement partial off occupancy based control for the lighting.
2. **Question asked via Zoom question pane by Michael Jouaneh:** A busy lobby may not be appropriate for occ sensor control since likely occupied all the time. Am thinking time clock should still be an option for auto shutoff. Also, some projects may not want lights in lobby off during business hours.
 - a. Nicole Hathaway: Thank you for your feedback! We will reach out via email to discuss lobby lighting control considerations in more detail for the Final Report.
3. **Question asked via Zoom question pane by Roger Baker:** Maybe I missed this, but is the savings/financial analysis for controls based on current LPD values, or do they assume 2028 proposed LPD values are concurrently adopted?
 - a. Nicole Hathaway: Thank you for your feedback! The draft analysis is based on the 2025 Energy Code LPD values. Each measure was calculated independent of the others.
4. **Question asked Verbally by Elizabeth Becker:** Have a lot of questions about lighting integrations. Believe lighting occupant sensing controls and HVAC occupied standby should be completely decoupled. A lot of areas where shutoff lighting seems reasonable, but may not want to set ventilation off in those areas. Lots of discrepancies between

tests. HVAC sensor testing is required to submit a separate form for each sensor. It's an egregious amount of time. Really pushing to decouple it. As mechanical engineering designers, we have no way of knowing if the lighting controls are triggering it. There's a lack of transparency.

a. Yao-Jung Wen: Thank you, we will connect with you after the meeting.

Wrap-Up

The meeting concluded with a call for participation throughout the code cycle. Several future meeting dates were presented. Draft CASE Reports are to be posted on title24stakeholders.com.

Please reach out to the specific topic lead or info@title24stakeholders.com with input on the measures presented today.

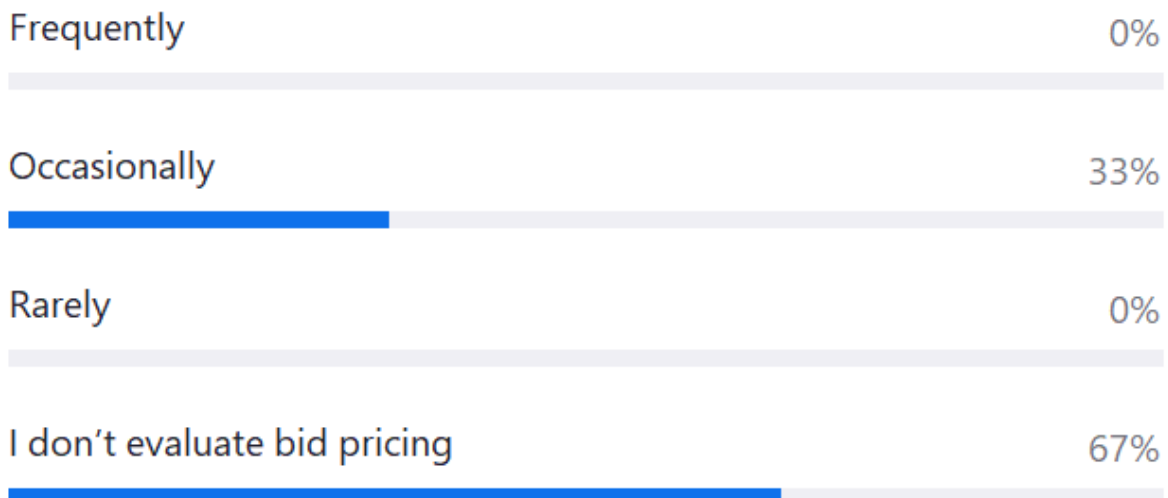
The meeting adjourned at 11:00 AM PST.

Zoom Polls & Responses

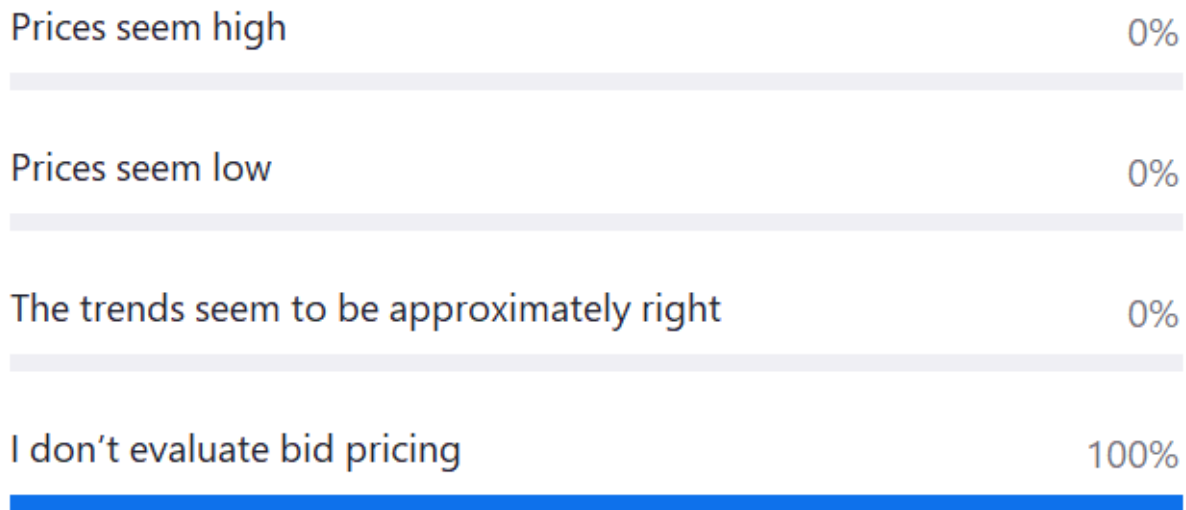
Multiple Choice Questions

Indoor Lighting Power Density

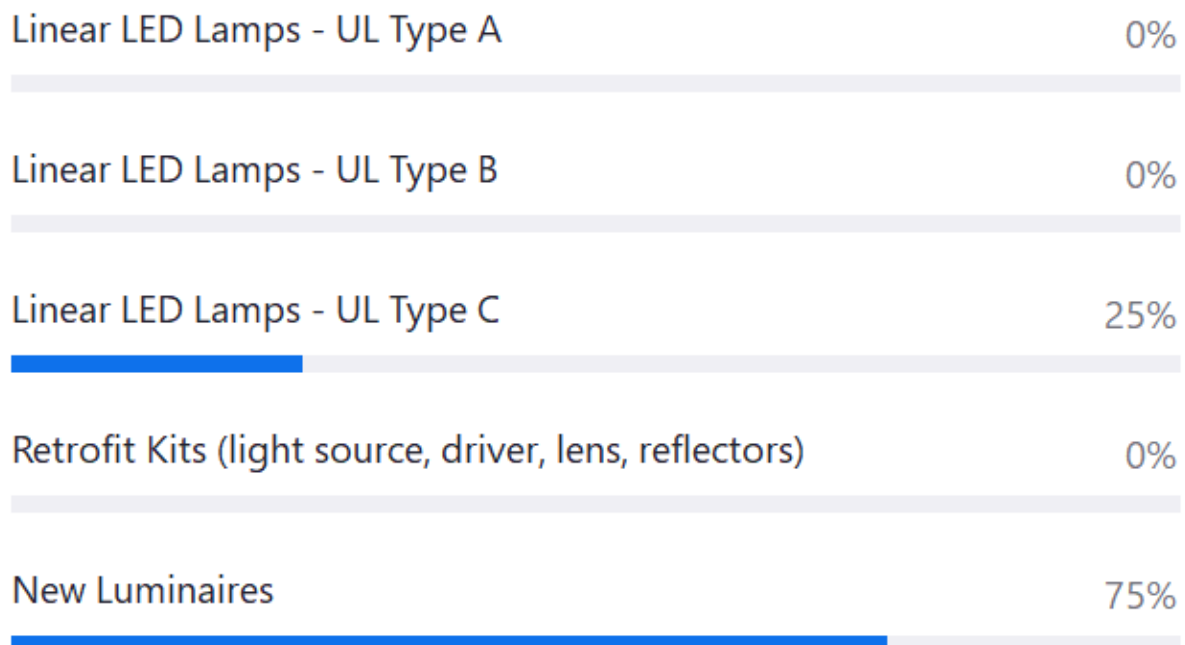
1. If you specify luminaires and evaluate bid pricing how common is it that the more efficacious luminaires cost less? (Single choice)



1. If you specify luminaires and evaluate bid pricing do you feel the prices shown here are in the right ballpark? (Single choice)

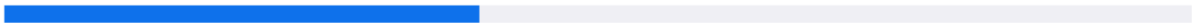


1. In your experience, what LED product category is most commonly installed for retrofit applications? (Single choice)

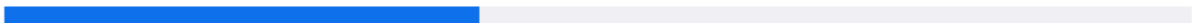


1. What is your preferred method for verification of the maximum rated label wattage of variable output luminaires? (Single choice)

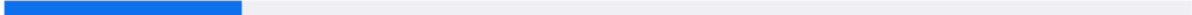
Plans examiner verification of specification sheet as compared to NRCC reported wattage 40%



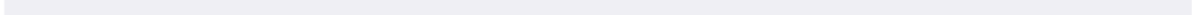
Field inspector verification of luminaire label after installation as compared to NRCI reported wattage 40%



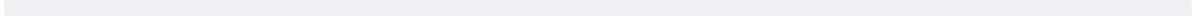
Either A or B 20%



Both A and B 0%

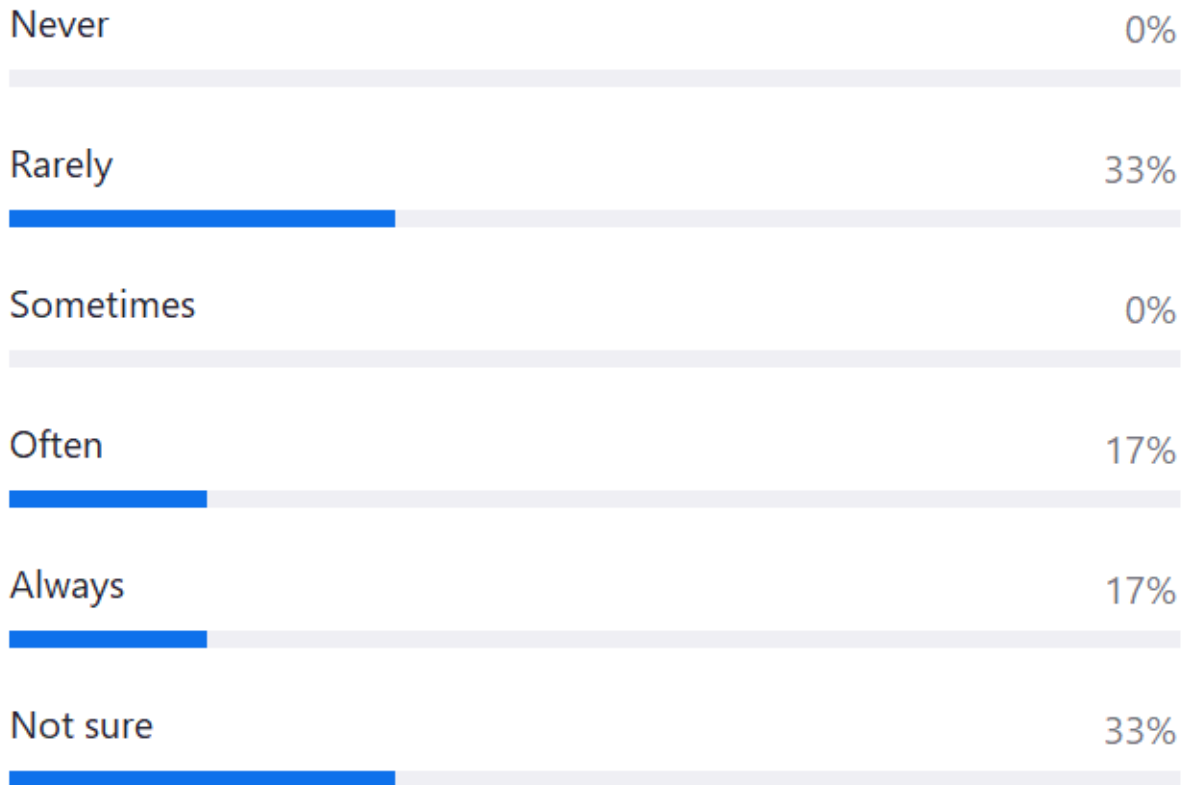


Other 0%

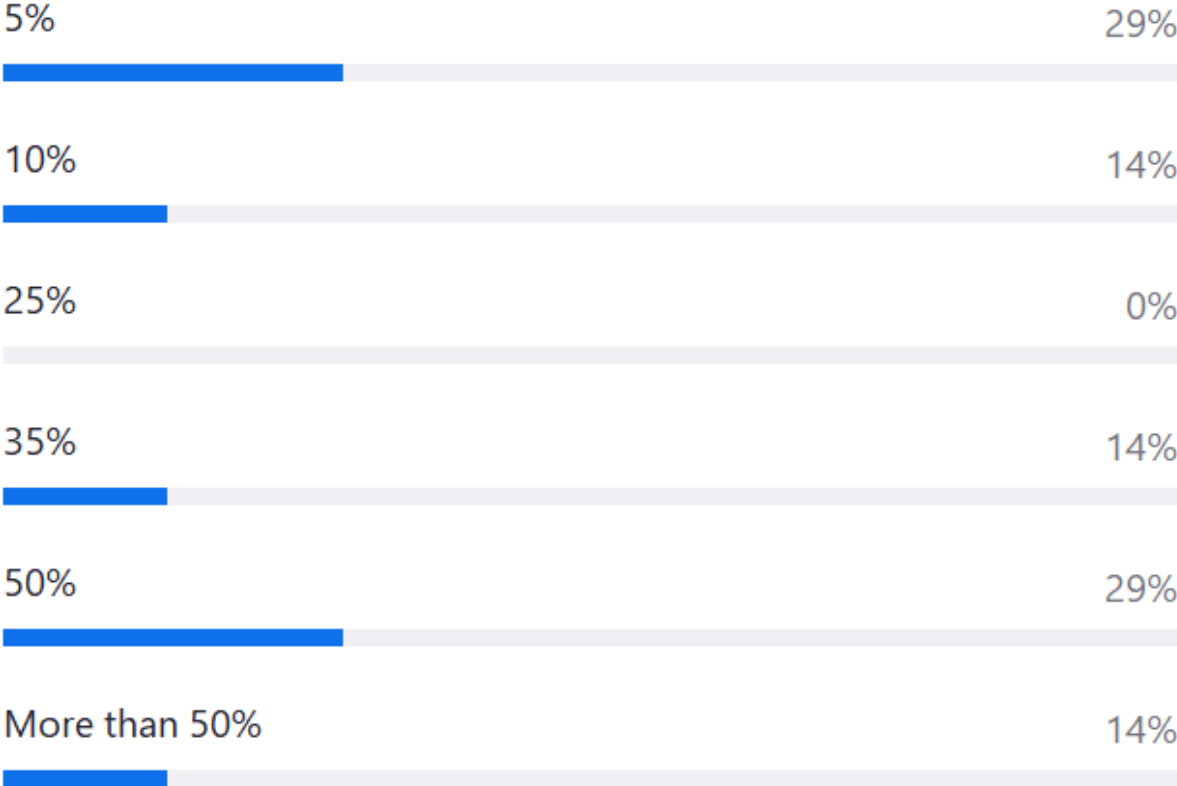


Lighting Controls

1. In a two-way entrance/exit, is the daylight adaptation zone sized for the lighting to cover both sides? (Single choice)

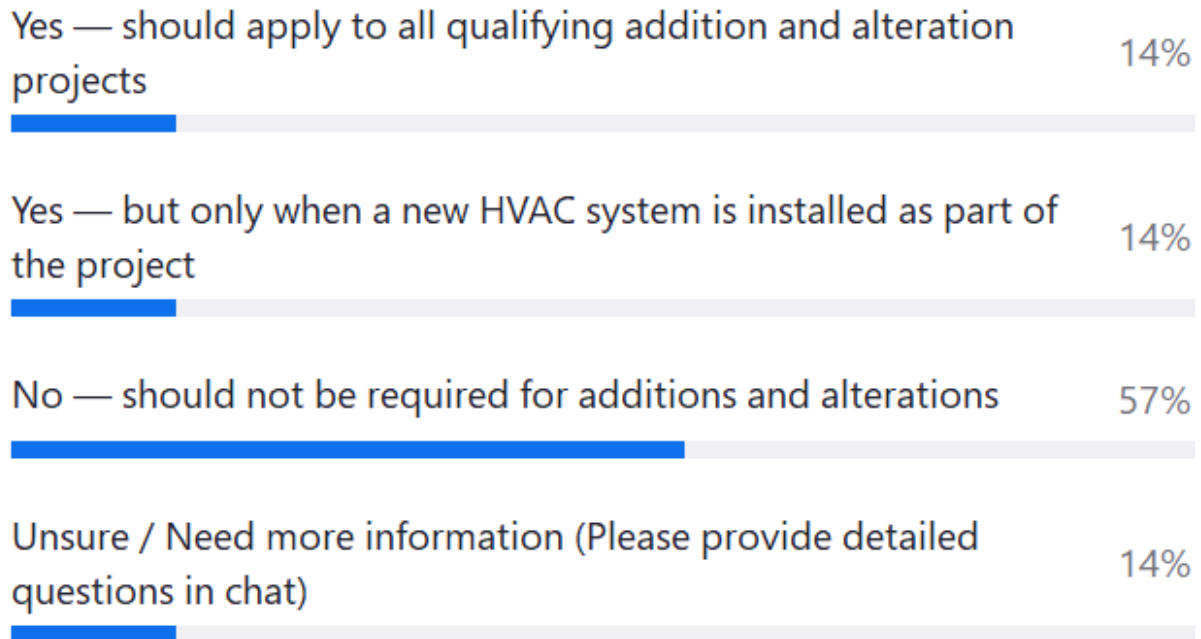


1. What percentage of commercial buildings in dense urban areas feature integrated parking garages? (Single choice)



1. Do you believe it is appropriate to require occupant sensing controls to trigger HVAC standby mode in addition and alteration projects?

(Single choice)



1. In recent projects, where have you installed occupant sensing controls even when not required by code? (Multiple choice)

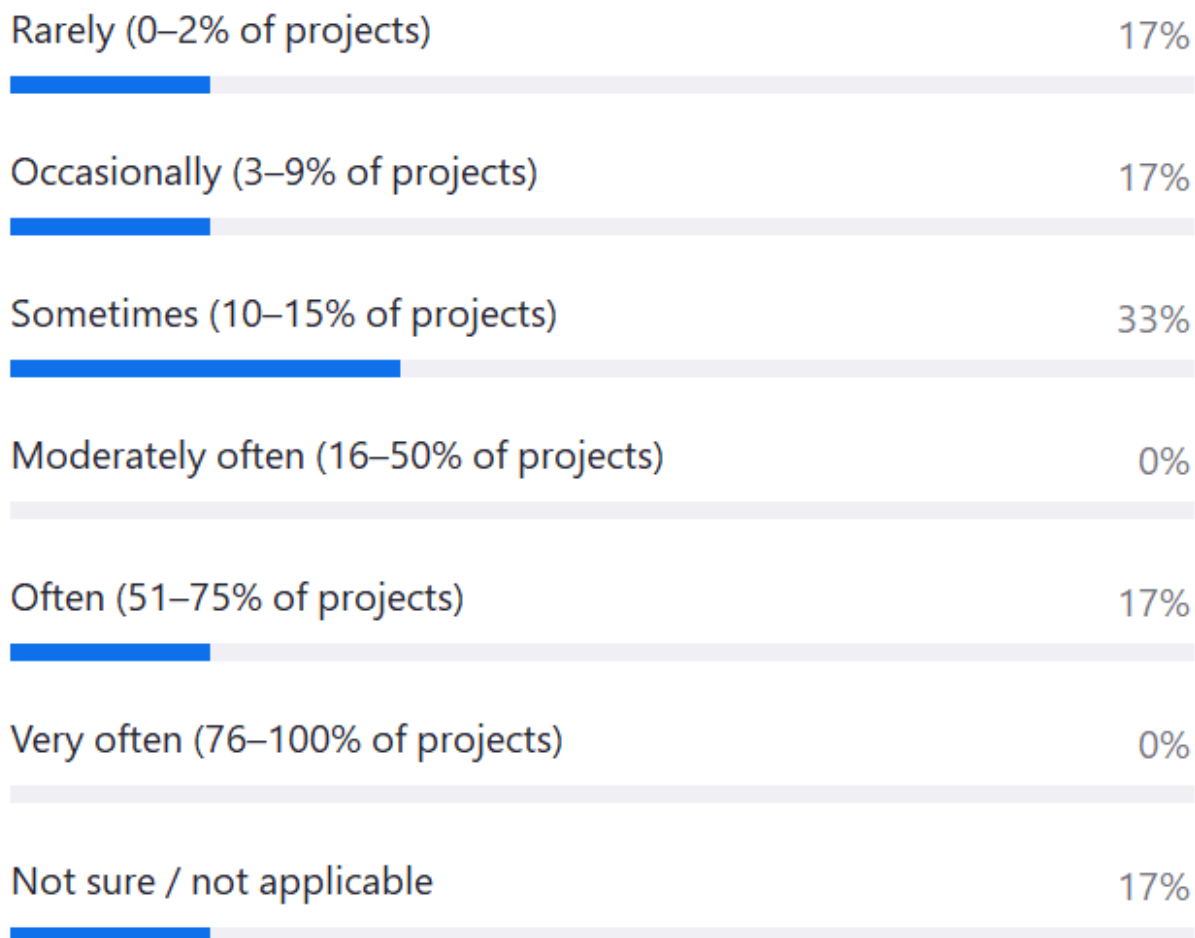


1. Based on your experience, how often are occupant sensing controls voluntarily installed when not required by code in NEW CONSTRUCTION? (Single choice)

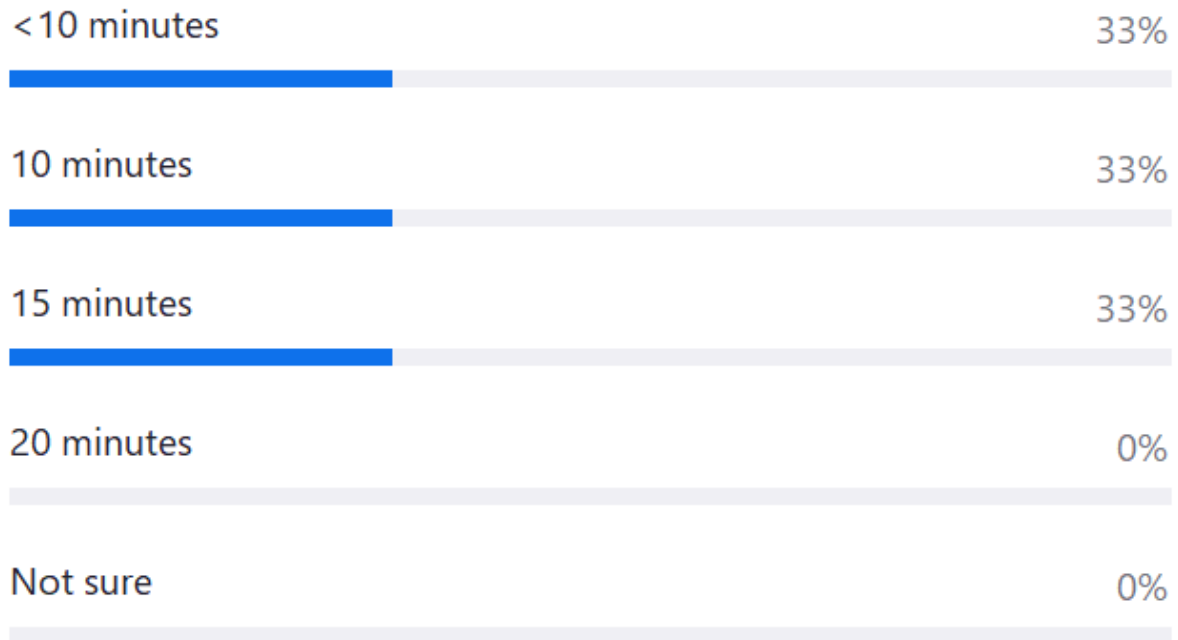
7/7 (100%) answered



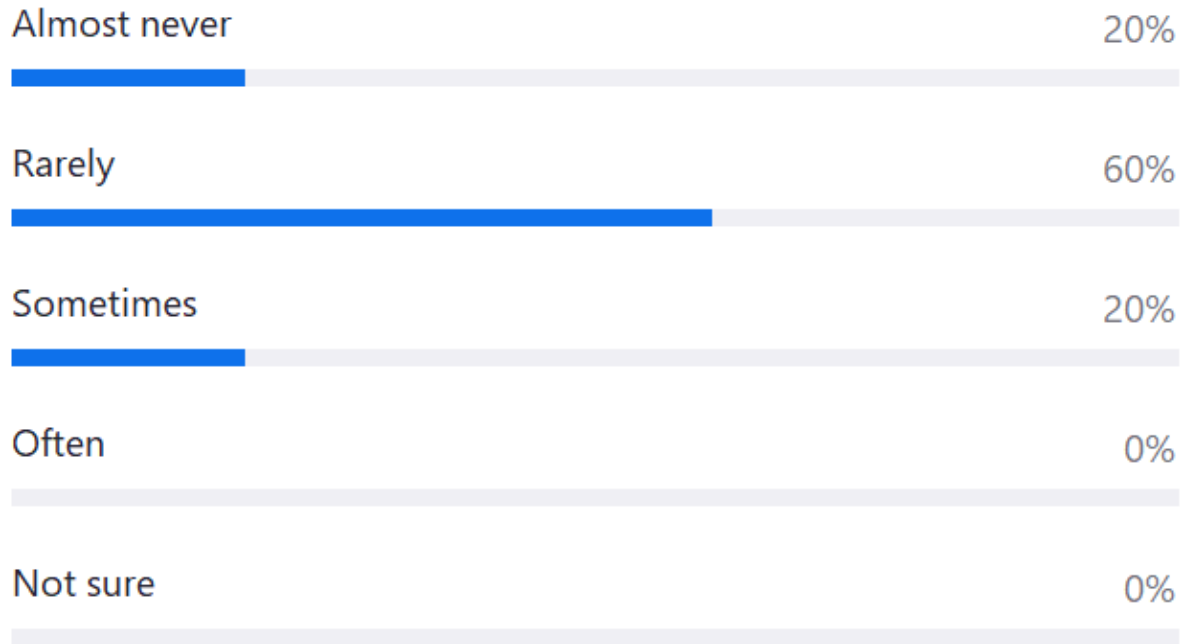
1. Based on your experience, how often are occupant sensing controls voluntarily installed when not required by code in ALTERATIONS?
(Single choice)



1. What is your typical maximum occupancy sensor delay time specified in construction documents? (Single choice)



1. How often are lighting occupancy sensors integrated with occupancy sensors for other systems (e.g. occupied standby for HVAC)? (Single choice)



1. Which option for triggering manual dimmer requirements would you support? (Single choice)

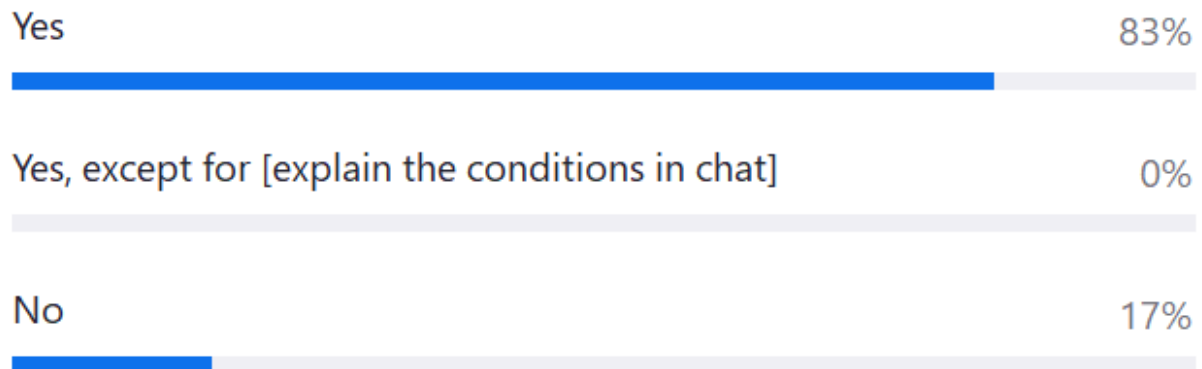
Wattage-based triggers for both residential and nonresidential spaces (our updated proposal; stringency for residential trigger is equivalent to 2025 code) 67%

Wattage-based trigger for nonresidential spaces, and the original LPD-based trigger for residential spaces 0%

LPD-based triggers for both residential and nonresidential spaces (same trigger for residential spaces and more stringent trigger for nonresidential spaces) 33%

1. What if scene controls are used in the space?

Should scene controls (without raise/lower buttons/sliders for continuous dimming) be considered comply with the manual dimmer requirement? (Single choice)



Long Answer Questions

Lighting Power Density

1. Which applications have LPDs that seem too low?

- a. Mike IMEG: Health Care Exam Rooms
- b. Jenna Luszczynski: Possibly data center aisle lighting

2. Which applications have LPDs that seem too high?

- a. Mike IMEG: Worship - Churches
- b. Jenna Luszczynski: Audience seating