Meeting Notes

Notes from 2022 Title 24, Part 6 Code Cycle
Utility-Sponsored Stakeholder Meeting for:

Lighting Part 2 – Nonresidential Indoor Lighting

Posted September 30, 2019

Meeting Information:

Meeting Date: September 12, 2019
Meeting Time: 8:30 am – 10:30 am PDT
Meeting Host: California Statewide Utility Codes and Standards Team

Meeting Attendees:

First Name	Last Name	Email	Affiliation
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Haile	Bucaneg		Energy Commission
Lorraine	White		Energy Commission
Veronica	Olvera		Energy Commission
Other			
Alex	Baker		IES
Bret	Barrow		Politico Group
Charles	Knuffke		Wattstopper
Clifton	Lemon		Clifton Lemon Associates
Clifton	Manahan		HLB Lighting
Erik	Page		Erik Page Associates
Gina	Rodda		Gabel Energy
Howard	Huo		Howard Huo
Jim	Levy		Up-light Electrical Engineering
Jon	Zelinsky		Prasino Energy
Kara	Quigg		Delta Light
Kelly	Seeger		Signify
Liam	Buckley		IES
Lilian	Fu		WSP
Lindsey	Perkins		Lighting design Alliances
Maria	Nazar		Engineering 350
Mark	Ouellette		ICF
Matthew	Hargrove		CBPA
Nick	Grahf		ICAST
Nicole	Hathaway		UC Davis
Robert	Raymer		CBIA
Sally	Blair		NORESCO
Sean	Denniston		New Buildings Institute
Susan	Larson		90+ Lighting

Therese	Fisher		ASWB Engineering
Tom	Paine		Consol
cVrushali	Mendon		Resource Refocus
Wayne	Alldredge		VCA Green

Meeting Notes

1.1 Welcome and Meeting Ground Rules

1. Rebecca Aviles (Energy Solutions) presented.

1.2 2022 Process Overview

1. Peter Strait (California Energy Commission) presented.
2. Kelly Cunningham (PG&E, Statewide Utility Codes & Standards Team) presented.

1.3 CASE Presentation: Indoor Lighting

1. Presentation and materials available here.

1.4 Networked Lighting Controls – Yao-Jung Wen (Energy Solutions)

1. Yao-Jung Wen (Energy Solutions, Statewide Utility Codes & Standards Team): Overall, this proposal seeks to introduce new Power Adjustment Factors (PAF) to encourage development of Networked Lighting Controls (NLC). No explicit requirements for NLCs are in 2019 Title 24, Part 6. While it is currently proposed as PAFs, the Statewide Utility Codes and Standards Team will consider making it a mandatory or prescriptive measure if it makes more sense as research and development progresses.
    a. Wayne Alldredge (VCA Green): I believe this NLC language should stay as PAF.
2. Charles Knuffke (Wattstopper): What energy multiplier will be used?
    a. Peter Strait (California Energy Commission): It might help to note that the proposal will need to show that the marginal benefit (energy savings) of networking the controls otherwise required by Title 24, Part 6 outweighs the marginal cost of doing so, including in small areas. Otherwise it will need appropriate thresholds or may indeed be made a PAF.
3. Yao-Jung Wen (Energy Solutions, Statewide Utility Codes & Standards Team): Considering the already mandatory control requirements, the proposed definition for NLCs in the context of Title 24 will be different from DLC's definition in that 1) Luminaires, retrofit kits and lamps will be included as elements of an NLC system (This is only to signify that they are an integral part of a complete NLC system and not to say that there will be additional specifications beyond what are already required.); 2) The NLC can meet the current mandatory control requirements; 3) The NLC can meet additional control requirements, including institutional tuning and granular zone controls in large areas; 4) Perhaps more importantly, other capabilities for achieving the ultimate goal of making the lighting system an integral part of the building as a flexible and responsive load that continues to operate at the maximum efficiency with traceable and verifiable performance.
    a. Clifton Lemon (Clifton Lemon Associates): I suggest adding detail to "other capabilities" for NLCs as controls integration is evolving, and code might play a role in impacting this evolution.

4. Poll 1 "Which of the Title 24, Part 6 methods do you recommend for increasing the energy benefits of NLCs?" *Results found in appendix.*
    a. Yao-Jung Wen (Energy Solutions, Statewide Utility Codes & Standards Team) Poll result find that more people in favor of functional credit instead of equipment.
5. Charles Knuffke (Wattstopper): I question the use of DLC for anything REQUIRED in Title 24, Part 6. However, DLC can mandate anything they want. There is no similar requirement in DLC to have a provable ROI payback, and this does not match up with Title 24, Part 6's ROI requirement for code changes.
    a. Jon McHugh (McHugh Energy Consultants): Charles, whatever we would propose would independently have to show cost-effectiveness.
    b. Peter Strait (California Energy Commission): Right. It is up to the proposer to show that the DLC specification is cost effective; if this cannot be shown, then it cannot be made a requirement in Part 6.
6. Yao-Jung Wen (Energy Solutions, Statewide Utility Codes & Standards Team): Market barriers include 1) high first cost, especially for retrofit projects, 2) large fixed cost limits NLCs to larger buildings, 3) requiring more advanced skill sets to set up and operate NLCs, 4) lack of 3rd-part data on long term energy benefits and customer values.
    a. Wayne Alldredge (VCA Green): My concern comes mainly from the thousands of small-ish TI's and small businesses getting started. Many of these small businesses are working on fixed schedules and tight budgets. They do not redesign their spaces for 10 to 15 years.
7. Clifton Lemon (Clifton Lemon Associates): Why cannot the California Energy Commission make its own qualified product lists (QPLs) for NLCs instead of relying on DLC?
    a. Peter Strait (California Energy Commission): If a proposer would prefer to draft their own QPLs, that is also acceptable. That said, we prefer to align with industry standards that professionals are currently using whenever possible.
    b. Charles Knuffke (Wattstopper): I would hope the California Energy Commission would make its own requirement for NLCs.
    c. Simon Lee (California Energy Commission): Having a California Energy Commission version of its own QPLs for NLCs can be a burden to manufactures and installers.
    d. Clifton Lemon (Clifton Lemon Associates): I understand that another QPL will be costly, but specifiers have a really hard time now finding what is certified by California. This is true for luminaires, lamps, and controls.
    e. Peter Strait (California Energy Commission): California Energy Commission cannot bias the cost-effectiveness analysis. Cost of establishing a separate QPL also needs to be factored into the cost-effectiveness analysis. The more requirements we lay on the more costly it becomes.
    f. Charles Knuffke (Wattstopper): I like NLC as a PAF, but I question using DLC's mandate to add it to a requirement in the code.
    g. Jon McHugh (McHugh Energy Consultants): Charles that is possible - there are a number of requirements which are not tied to a third party's QPL, and this is part of the discussion.
8. Simon Lee (California Energy Commission): Regarding incremental cost, one needs to include owner's staff cost to implement related to any on-going service subscription (software renewal or upgrade).
9. Tom Paine (Consol): Advising for setting up and maintaining networks for managing the lights is going to be a barrier.
10. Clifton Lemon (Clifton Lemon Associates): Large complex NLCs appropriate for big buildings but should not be driving requirements for smaller buildings.

    a. Kelly Seeger (Signify): I agree. Needs, services, and market concerns are different depending on the size of a building.
    b. Jon McHugh (McHugh Energy Consultants): Are you proposing that requirements for NLCs differ depending upon building size or type, or do you recommend that PAFs vary by the capabilities?
    c. Kelly Seeger (Signify): I am simply agreeing with others that there is not a "one size fits all" mentality with NLCs. We have to consider market drive and needs, building size and services, and personnel, etc.
11. Poll 2: "What is the lighting system threshold size above which NLCs are cost-effective and/or where is it likely that facility staff will be able to make sure of the advanced features of the NLCs?" *Poll results found in appendix*.
    a. Clifton Lemon (Clifton Lemon Associates): Which discipline will specify, install, operate and maintain NLCs? The job title "system integrator" is new and there are not many around
12. Poll 3: "Which of the following building types will benefit most from NLCs as they are available today? Select all that apply." *Poll results found in Appendix*.
    a. Yao-Jung Wen (Energy Solutions, Statewide Utility Codes & Standards Team): 10,000 square feet receives the most votes, with many saying it is too dependent on the facility.
    b. Wayne Alldredge (VCA Green): A We-Work space of 20,000 square feet makes sense, a 1,000,000 square feet warehouse does not.
    c. Tom Paine (Consol): Wayne, perfect example. Application variability is going to be the biggest driver.
    d. Wayne Alldredge (VCA Green): Be careful with Institutional Tuning. It is easy to game the code.
    e. Charles Knuffke (Wattstopper): If NLC will be a PAF, what multiplier are you estimating for that PAF?
        i. Chris Uraine (Energy Solutions, Statewide Utility Codes & Standards Team): We are still determining.
13. Jon McHugh (McHugh Energy Consultants): Any reason that PAFs for tuning to small zone occupancy sensing should be different for NLC as for another control that achieves the same objective?
14. Tom Paine (Consol): Maintenance/management is going to be a cost.
15. Wayne Alldredge (VCA Green): A Title 20 appliance that can be hard limited to 85% should be allowed to qualify for Institutional Tuning PAF.
    a. Peter Strait (California Energy Commission): I believe part of the point of institutional tuning is to be able to adjust the lighting upward to account for the natural decrease in light output due to age. A hard limit at 85% might not allow that.
16. Charles Knuffke (Wattstopper): It would be interesting to know the percent of projects that currently use any PAF, and which PAFs they use.

1.5 Update Lighting Power Densities

1. Clifton Lemon (Clifton Lemon Associates): Definitely include ageing eye, tunable and dim to warm.
    a. Jon McHugh (McHugh Energy Consultants): Aged eye, tunable, and dim-to-warm was included in the 2019 code cycle.

2. Charles Knuffke (Wattstopper): It would help to have data on the number of projects that use performance or prescriptive calculations, and if using prescriptive whether it is the Complete, Area, or Tailored approach.
3. Jim Levy (Up-Light Electrical Engineering): You should also consider allowance for bacteria cleaning fixtures possibly.
4. Wayne Alldredge (VCA Green): Code should be technology agnostic and focus on performance only.
5. Clifton Lemon (Clifton Lemon Associates): In my opinion, PoE (Power-over-Ethernet) is a stopgap measure, and DC systems are a much more robust approach that will come sometime in future. Can code anticipate this somehow?
    a. Bernard Bauer (Integrated Lighting Concepts): we will be looking at this closely and revisiting what we started on the 2019 code cycle.
6. Lilian Fu (WSP): RGBW (a source that uses the three primary colors Red, Green and Blue, and White to produce light) light fixtures should also be accommodated as much as tunable white, as this technology is being used for both functional and event lighting in modern offices and assembly spaces in many building types.
    a. Charles Knuffke (Wattstopper): Are you suggesting RGBW for colored light, or as a way of doing Tunable white?
    b. Lilian Fu (WSP): As a way of doing both.
    c. Charles Knuffke (Wattstopper): RGBW as Tunable White is allowed and benefits from language in 2019 code already.
7. Wayne Alldredge (VCA Green): Everything comes down to watts per square foot.
8. Tom Paine (Consol): DC (direct current lighting) has lots of potential, but needs more ground-up, system wide planning and review.
9. Kara Quigg (Delta Light): Can someone go into more detail on what a "use it or lose it adder" is?
    a. Chris Uraine (Energy Solutions, Statewide Utility Codes & Standards Team): In table 140.6-C, there are descriptions. It is essentially additional wattage you could use.
    b. Charles Knuffke (Wattstopper): “Use it or lose it” means you have additional wattage for specific functions - if you do not use it for that application, you "lose" that wattage for any other purpose.
    c. Peter Strait (California Energy Commission): The purpose of "use it or lose it" is to recognize that some features require additional power - it is a way to avoid discriminating. E.g., if your lighting has a dim-to-warm feature, then we know that it uses slightly more power and we are not intending to restrict or prohibit that feature.
    d. Simon Lee (California Energy Commission): "Use-it-or-lose-it" lighting power is for the Area Category method only from the 2019 code.
    e. Peter Strait (California Energy Commission): Conversely, though, if the lighting does not have that feature, then the baseline assumption applies and that system does not need an additional allowance.
10. Poll 4: “How frequently do you see dim-to-warm controls being specified on projects? Select one.” *Poll results found in appendix*.
    a. Jim Levy (Up-Light Electrical Engineering): Dim to warm is growing in popularity.
    b. Lindsey Perkins (Lighting Design Alliances): What do you mean "dim to warm controls?" Is that not standard controls, but rather the fixture gets warmer as it dims? Do you mean color tuning controls, which would be in addition to intensity controls?
        i. Yao-Jung Wen (Energy Solutions, Statewide Utility Codes & Standards Team): Yes, dim to warm control is a standard control, but the fixture gets warmer as it dims. The concern is those luminaires might be less efficacious and might need additional accommodation in terms of LPDs.

ii. Bernard Bauer (Integrated Lighting Concepts, Statewide Utility Codes & Standards Team): Dim to warm and color tune apply to both general and task or display lighting.

c. Peter Strait (California Energy Commission): Note that "colored light" only applies if the unit is incapable of producing white light.
d. Bernard Bauer (Integrated Lighting Concepts, Statewide Utility Codes & Standards Team): We will also look at RGB (a source that uses the three primary colors Red, Green and Blue to produce white light) as tunable white but not necessary add it in that group.
e. Kara Quigg (Delta Light): All designers want is dim to warm because we cannot use halogen. It is being specified everywhere in Los Angeles.
f. Wayne Alldredge (VCA Green): Are we talking about giving dim to warm PAF credit to Display lighting? I thought that was not proposed. If I am wrong, I retract my statement.
    i. Kelly Cunningham (PG&E, Statewide Utility Codes & Standards Team): No. We want to make sure they can be accommodated by the LPD limits or offer a use-it-or-lose it adder.
    ii. Bernard Bauer (Integrated Lighting Concepts, Statewide Utility Codes & Standards Team): My understanding is that it is luminaire driven and not space driven, so yes, it could apply to display lighting.
    iii. Wayne Alldredge (VCA Green): But are we getting a credit, or are we just regulating the lighting quality?
    iv. Bernard Bauer (Integrated Lighting Concepts, Statewide Utility Codes & Standards Team): Again, this is luminaire driven, not space or use type driven.
g. Charles Knuffke (Wattstopper): Tunable White and Dim to warm get mentioned twice in the code. For small aperture tunable-white and dim-to-warm luminaires, there is a 75% multiplier opportunity for their power. Additionally, these technologies are available for certain Health Care applications in the Area Method Table.
h. Wayne Alldredge (VCA Green): But are we getting a credit, or just regulating the lighting quality?
    i. Jon McHugh (McHugh Energy Consultants, Statewide Utility Codes & Standards Team): Yes, this is a PAF which applies to the installed lighting. This is compared against the allowed lighting budget.
i. Jon McHugh (McHugh Energy Consultants, Statewide Utility Codes & Standards Team): To clarify the adjustment factors for color tuning and dim to warm luminaires; they are based off the calculation of the adjusted power of your lighting system and then compared against your allowed lighting power.

11. Poll 5: "How frequently do you see tunable white controls being specified on projects?" *Poll results found in appendix*.
    a. Jim Levy (Up-Light Electrical Engineering): "Tunable White (TW)" is growing in popularity.
12. Poll 6: "How frequently do you see round and square luminaires with less than 4 inch apertures specified on projects? Select one." *Poll results found in appendix*.
    a. Jim Levy (Up-Light Electrical Engineering): Small apertures are the latest trend.
    b. Kara Quigg (Delta Light): Small aperture is pretty much the only thing being specified.
    c. Wayne Alldredge (VCA Green): The popularity is growing only in higher end offices where personnel productivity is of concern.
13. Poll 7: "How frequently do you see linear luminaires with less than 4 inch aperture specified on projects? Select one." *Poll results found in appendix.*
    a. Jon McHugh (McHugh Energy Consultants): Do DOE's projections on efficacy match your impressions of ongoing increases in efficacy?

b. Peter Strait (California Energy Commission): 2019 code allows for the use of LED lamps (specifying that if you want to count the lamp wattage rather than fixture wattage, then the lamp must meet JA8).
    i. Gina Rodda (Gabel Energy): Peter, I thought that was only for recessed luminaires. It does not help with many of the fixtures we are seeing people would like to use with TLEDs.
    ii. Peter Strait (California Energy Commission): Right, screw-base lamps. TLEDs in fluorescent troffers are an issue because you have ongoing ballast losses. Screw-base sockets do not have ballasts, so it is less of an issue.
c. Clifton Lemon (Clifton Lemon Associates): I agree that diminishing availability for lamp-based luminaires is a problem since bulbs are very user friendly.

1.6 Multi-zone occupancy sensing in open plan offices (Jon McHugh (McHugh Energy Consultants)

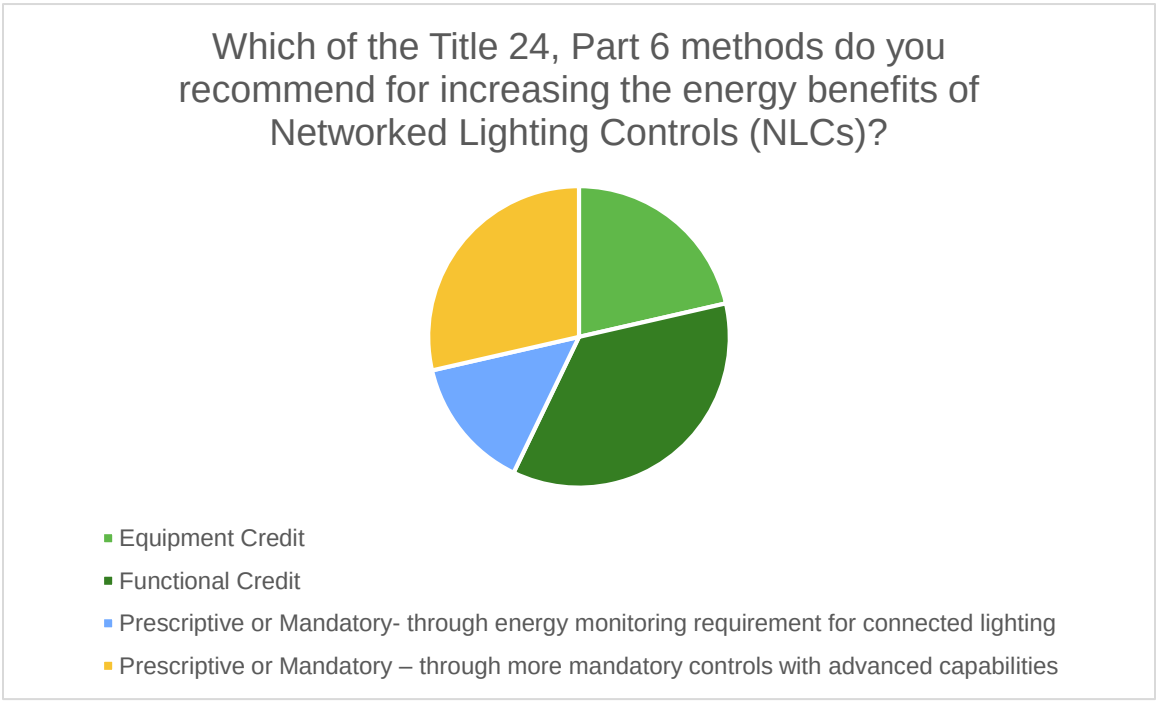
1. Jon McHugh (McHugh Energy Consultants, Statewide Utility Codes & Standards Team): The goal of this submeasure is to harmonize with IECC 2018.
2. Clifton Lemon (Clifton Lemon Associates): This is for Kelly Cunningham: as we discussed in our IESSF event, will the code cleanup effort include proposals for simplifying some of the confusion between what is covered in Title 20 and Title 24, Part 6.
    a. Peter Strait (California Energy Commission): We're doing what we can. Appliance standards and building standards have to conform to different requirements (e.g., federal preemption rules), and each proceeding has to be responsive to received public comments.
    b. Kara Quigg (Delta Light): Both the designers that are specifying and the manufacturers that are producing product are confused on with what they need to comply.
    c. Clifton Lemon (Clifton Lemon Associates): Peter, I realize that the structure of the code change required might be big, but specifiers simply cannot figure out what is compliant, so our feedback is that maybe a pretty big effort is in order and we'd like to help advise. Access to a clear and searchable QPL for Title 20 is still a problem.
    d. Peter Strait (California Energy Commission): We hit some technical walls regarding an automatic cross-check between lists within MAEDBS; the feature became a resources issue.
3. Kelly Cunningham (PG&E, Statewide Utility Codes & Standards Team): With regards to code clean up, we are seeking comments, but we are also looking for solutions for corrections
4. Michael Jouaneh (Lutron): You should eliminate the PAFs for smaller zone occupancy sensing, if this becomes a mandatory.
5. Simon Lee (California Energy Commission): We need to consider egress lighting to stay ON for spaces in occupied buildings.
6. Michael Jouaneh (Lutron): The HVAC part adds complexity. Is this proposal for lighting only?
    a. Wayne Alldredge (VCA Green): It is just an aux contact for the HVAC tie in already for local controls. Networked controls can use BACnet or something similar.
    b. Clifton Lemon (Clifton Lemon Associates): Michael, you are right, but the complexity is evolving in building industry anyway. There is no need to have multiple sensor arrays for different building systems and like Wayne says they can use BACnet. In my opinion, we should incentivize controls integration.
    c. Charles Knuffke (Wattstopper): HVAC part is often an expected feature for HVAC integration, which unfortunately you only find out about once the products are installed.

7. Simon Lee (California Energy Commission): The proposal needs to include flexibility to allow more than one approach - aux. contact or networked control (BACnet and others). The cost analysis needs to reflect the approach as well.
    a. Peter Strait (California Energy Commission): Agreed, we need to maintain an amount of agnosticism regarding implementation. Our interest is in ensuring the building provides efficiency-enabling control functions and features, not in dictating the precise way they are done.
8. Charles Knuffke (Wattstopper): Just to be clear, signal interference is only an issue with SOME manufactures.
9. Charles Knuffke (Wattstopper): I am interested in seeing the ROI on this. The IECC does not have a ROI requirement, and I wonder if it is evaluated based on LED loads.
10. Tom Paine (Consol): I am thinking for open office controls that the amount of dimming applied to a single fixture or zone could be based on the total number of zones occupied. If one space was empty, it might dim by 20 or 40%, and then up to 60, 80, or 100 as the space is emptied.
    a. Charles Knuffke (Wattstopper): That is a great thought, but anything that adds complexity in programming for the user should be an optional Sequence of Operation, not a requirement.
11. Charles Knuffke (Wattstopper): This would be a requirement, and not a PAF, right?
    a. Chris Uraine (Energy Solutions, Statewide Utility Codes & Standards Team): That is correct.
12. Poll 8, 9, and 10.
    a. Erik Page (Erik Page & Associates): In 2022 and beyond, the Internet of Things (IOT) will be even more "real." So please do not get so prescriptive that you disallow new approaches that might allow cheaper/better solutions (e.g., do not require a ceiling mounted dual tech occupancy sensor when many cheap workstations located at occupancy sensors might work better).
    b. Clifton Lemon (Clifton Lemon Associates): Exactly, this is where I was going when thinking about integrated controls. Good engineering means not repeating components when unnecessary. Occupancy sensors can run many building systems at once.
    c. Charles Knuffke (Wattstopper): Do not be prescriptive when performance language could be used.
    d. Thao Chau (California Energy Commission): The performance approach allows prescriptive requirements to be traded off.
    e. Chris Uraine (Energy Solutions, Statewide Utility Codes & Standards Team): Erik, thank you for your feedback. I mentioned at some point, but to reiterate, we want to ensure our proposals make sense and are not inhibiting new technologies. We are happy to discuss offline.
    f. Charles Knuffke (Wattstopper): Have you received any feedback from tenants at locations where the IECC requirement has been implemented? Or owners?
    g. Chris Uraine (Energy Solutions, Statewide Utility Codes & Standards Team): I do not think we have any feedback from tenants or owners, but that is a good point. We will consider how to gather this feedback.
    h. Charles Knuffke (Wattstopper): Please do. Many good ideas have been de-implemented due to complaints from the folks paying the bills in the space.
13. Poll 11: "What problems do you see with RS Means cost estimate? Select all that apply." Poll results found in appendix.
    a. Wayne Alldredge (VCA Green): On average, I think dual technology sensors are around only 20% of the total sensor number.

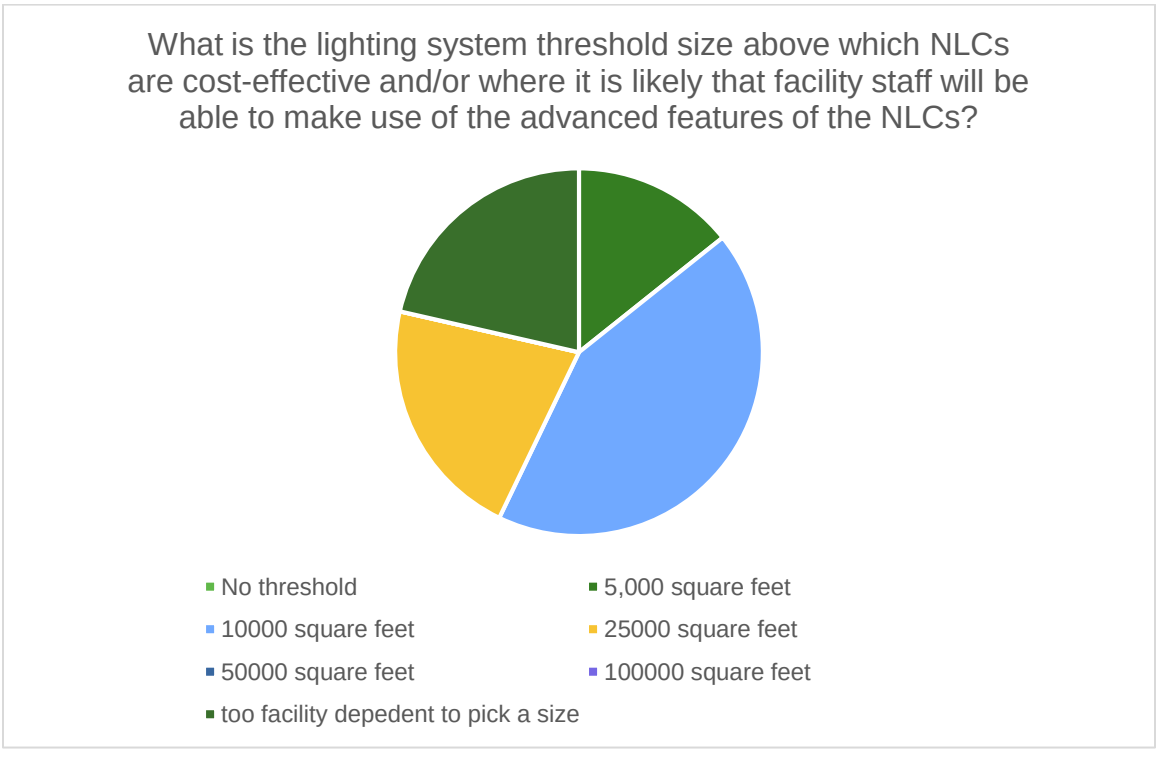
b. Tom Paine (Consol): There is going to be a cost associated with getting the system connected to the network and verifying the system is working. These are tasks outside of what a typical electrician is generally prepared to do, especially when internet is not available at time of installation.
c. Michael Jouaneh (Lutron): Conservative numbers are that many systems are wireless and less costly to install.
d. Wayne Alldredge (VCA Green): 20 minutes is the appropriate MAX time delay.
e. Charles Knuffke (Wattstopper): I recommend letting specifiers determine type of sensor to be used and not be prescriptive.
f. Erik Page (Erik Page & Associates): The smaller your zones are, the shorter your delay can be. If the zone is 1 person, it can probably be as low as 5 minutes.
g. Tom Paine (Consol): I think 20% is going to be very apparent when it is only one or two zones that are empty, and end users probably will not like that.
h. Wayne Alldredge (VCA Green): Garages should be much faster; small private offices can be 5 minutes; small bathrooms should be 5 minutes, etc.
i. Michael Jouaneh (Lutron): 20 minutes and 20% is good.
j. Michael Jouaneh (Lutron): Enclosed office lighting does not need to be tied to the open office. Lighting in open office will go on automatically when someone walks into open office.
k. Charles Knuffke (Wattstopper): I go back to an earlier comment - it would be very helpful if we had data about which PAFs designers took advantage of. Since there has been a very large PAF for use of sensors in smaller spaces, if it hasn't been used by specifiers, that would tell us it is difficult to implement and/or cost.
l. Simon Lee (California Energy Commission): I am interested to find out as well.
m. Bernard Bauer (Integrated Lighting Concepts, Statewide Utility Codes & Standards Team): We cannot address PAFs for controls, but rather those used frequently with LPDs in Area and Tailored compliance.
n. Charles Knuffke (Wattstopper): The small zone PAF has been in Title 24, Part 6 since the 2013 code.
o. Michael Jouaneh (Lutron): It is time to retire that PAF.
p. Charles Knuffke (Wattstopper): Surely, we have some data on whether it has been used.
q. Wayne Alldredge (VCA Green): PAFs are seldom used now because you do not need them with LEDs going into spaces that have fluorescent LPD requirements.
r. Gina Rodda (Gabel Energy): I agree with Wayne, we will know more with the 2019 code, but that will be too late for us to use for 2022.
s. Wayne Alldredge (VCA Green): It just takes time to calculate, and there is no point at the moment. The 2019 LED LPD baseline might change that.

1.7 Appendix A: Poll Results

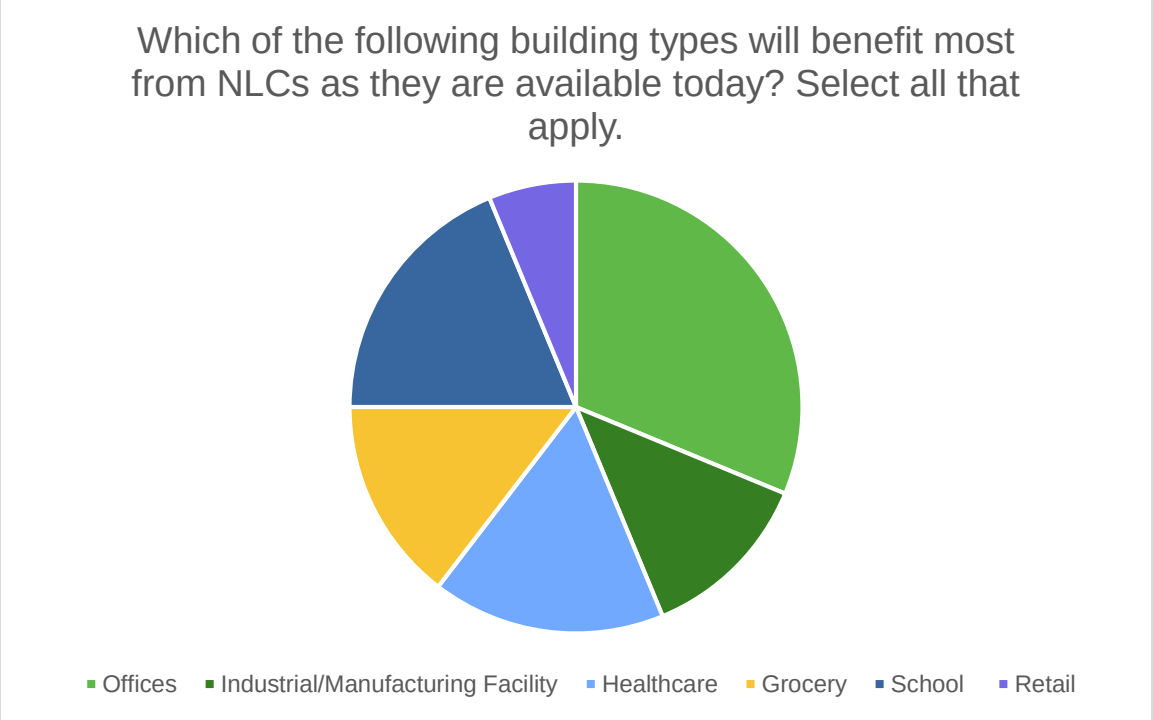
Poll 1:



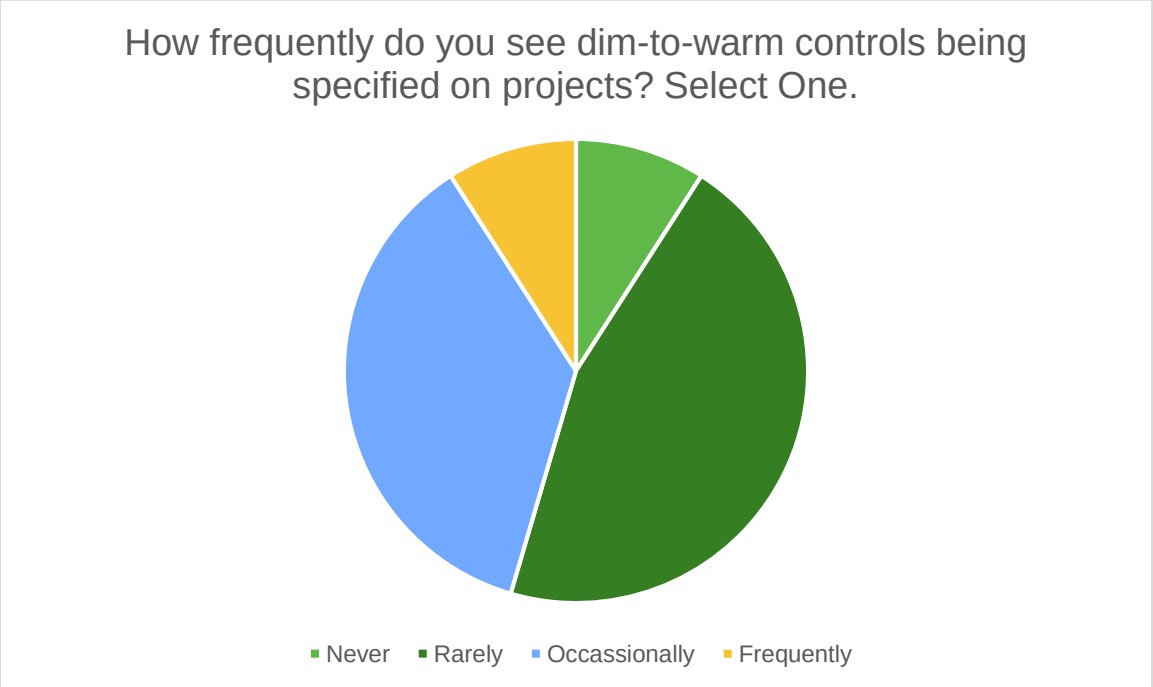
Poll 2:



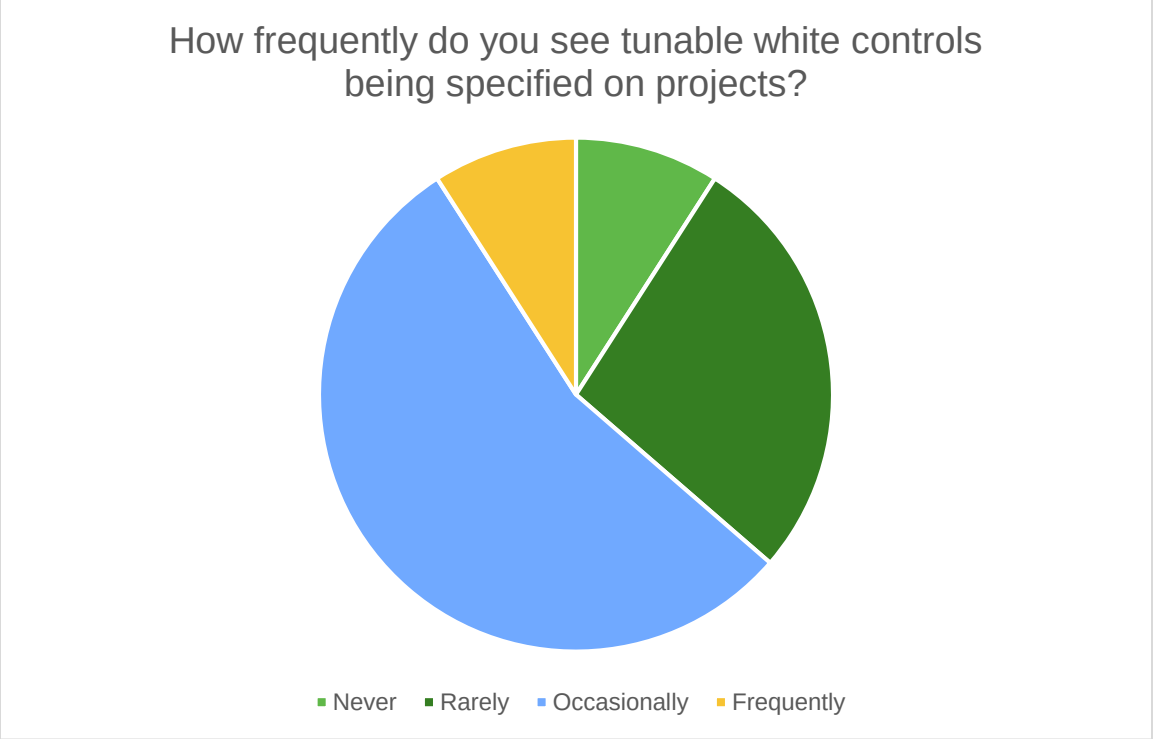
Poll 3:


Which of the following building types will benefit most from NLCs as they are available today? Select all that apply.
Offices
Industrial/Manufacturing Facility
Healthcare
Grocery
School
Retail

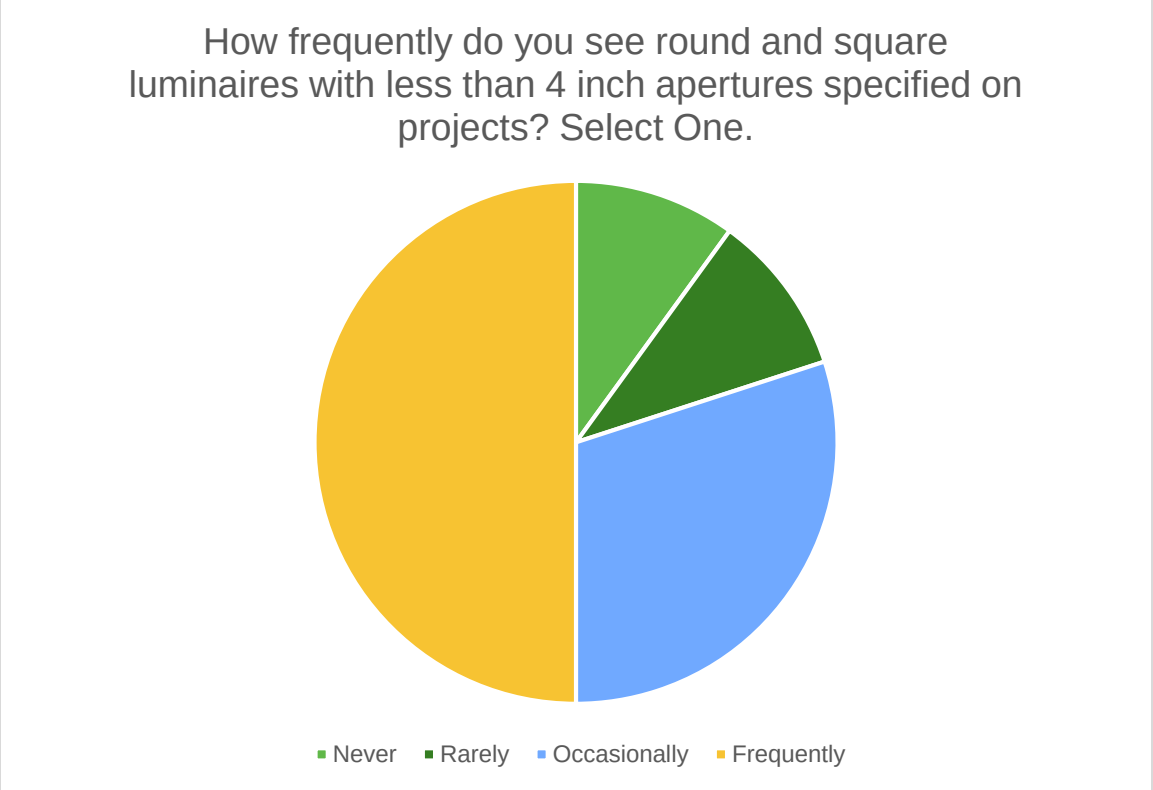
Poll 4:


How frequently do you see dim-to-warm controls being specified on projects? Select One.
Never
Rarely
Occassionally
Frequently

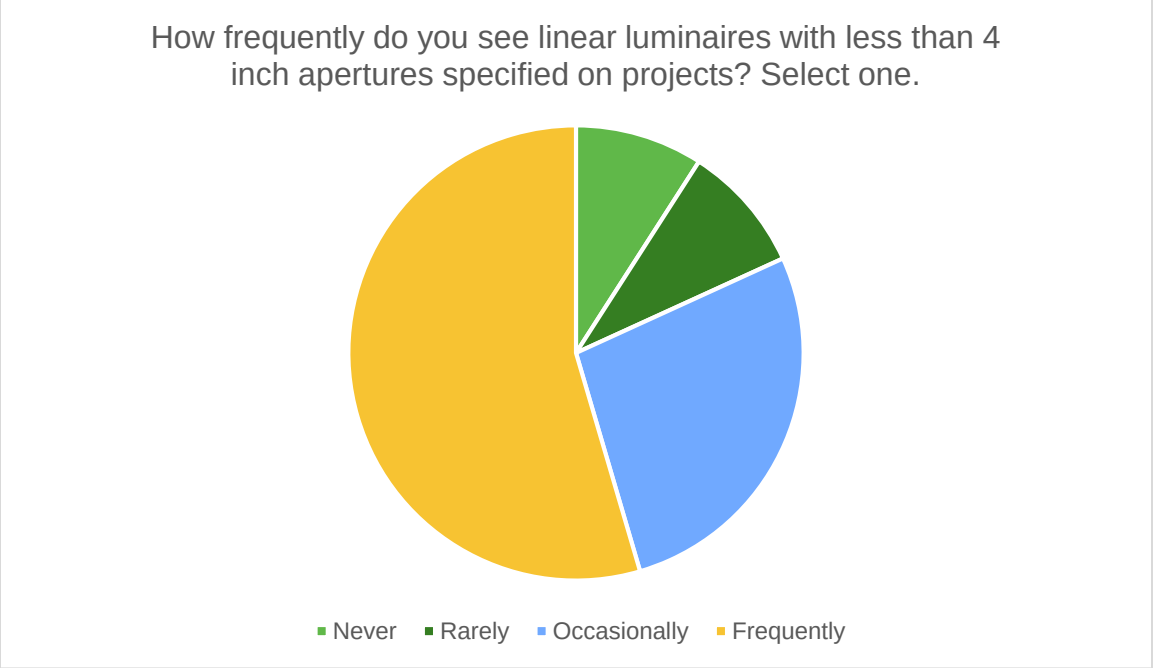
Poll 5:


How frequently do you see tunable white controls being specified on projects?
Never
Rarely
Occasionally
Frequently

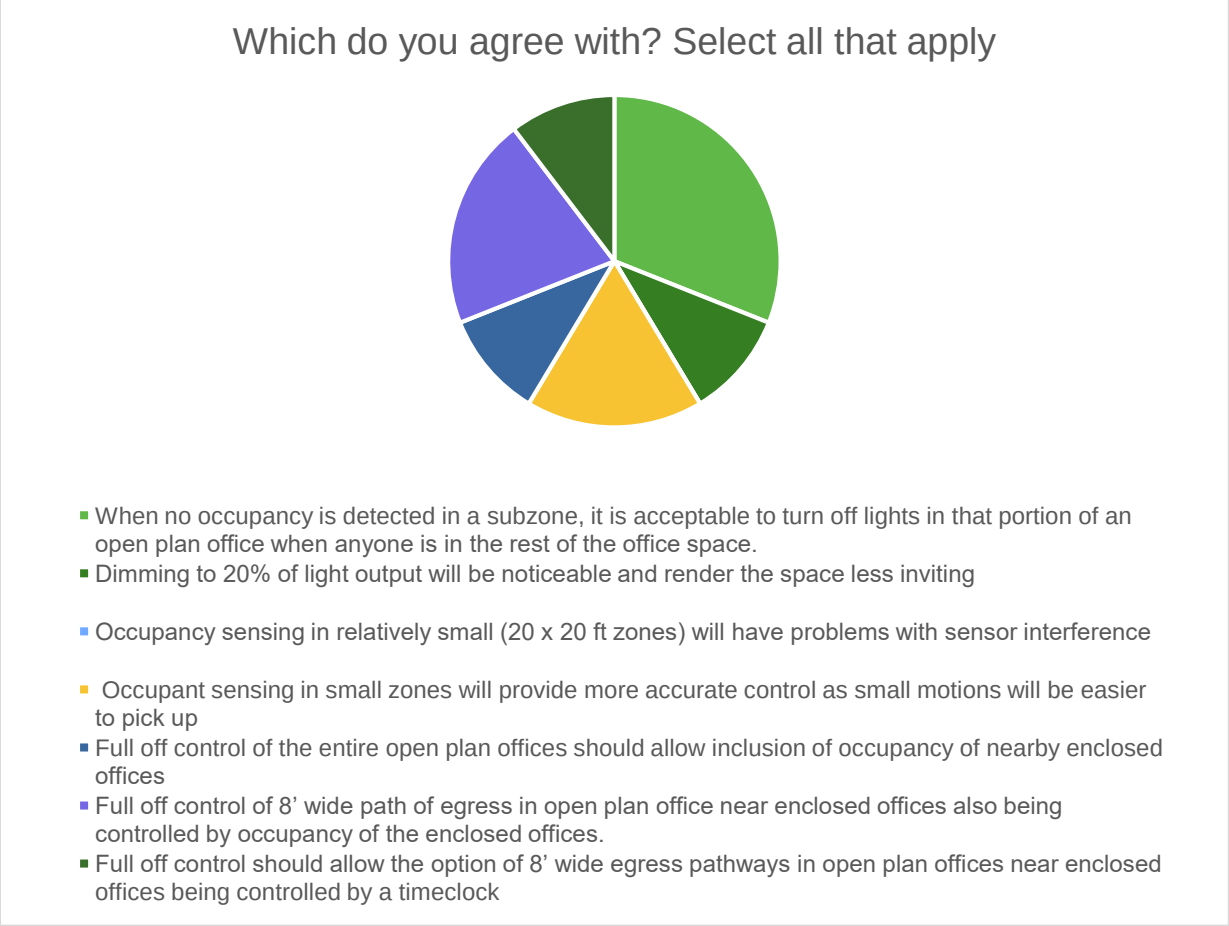
Poll 6:


How frequently do you see round and square luminaires with less than 4 inch apertures specified on projects? Select One.
Never
Rarely
Occasionally
Frequently

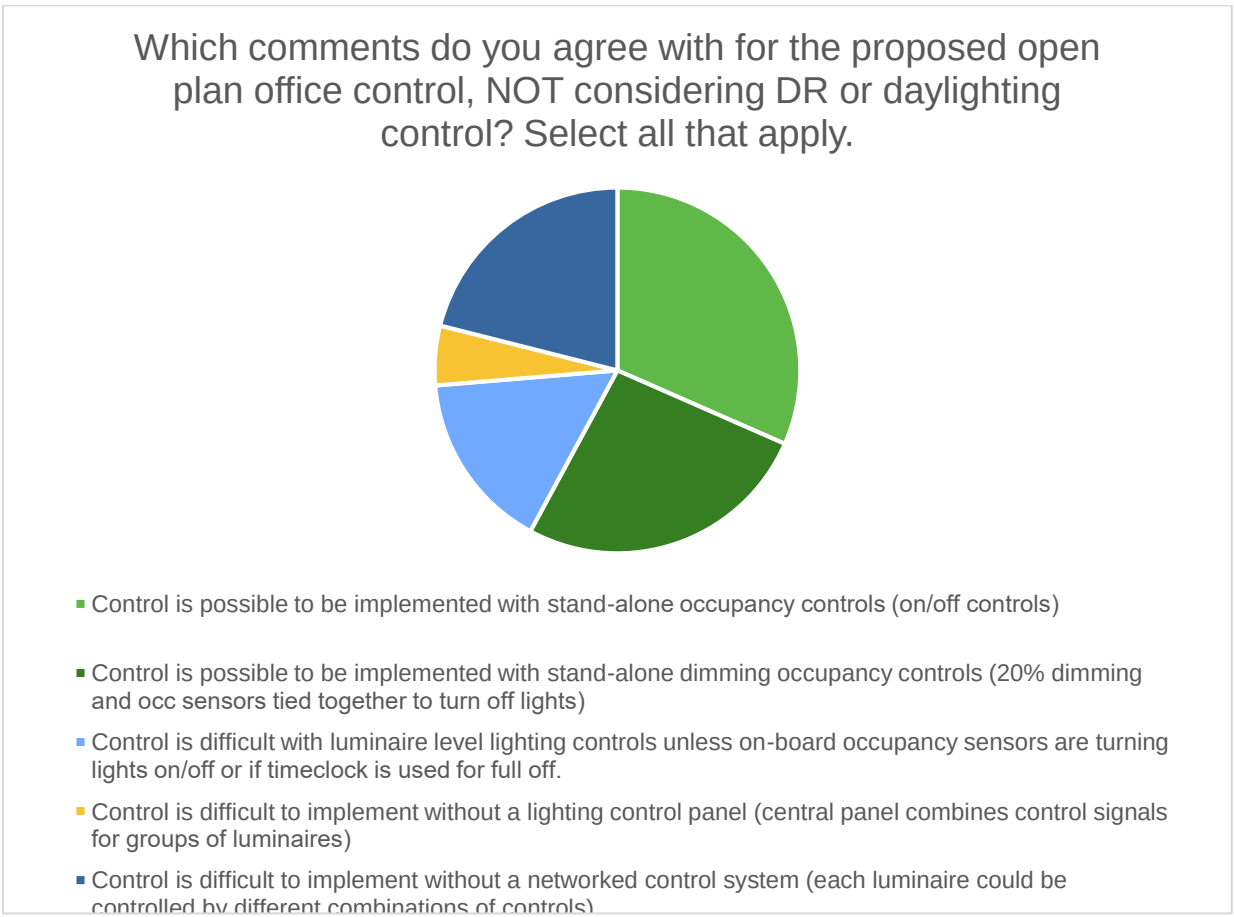
Poll 7:


How frequently do you see linear luminaires with less than 4 inch apertures specified on projects? Select one.
Never
Rarely
Occasionally
Frequently

Poll 8:

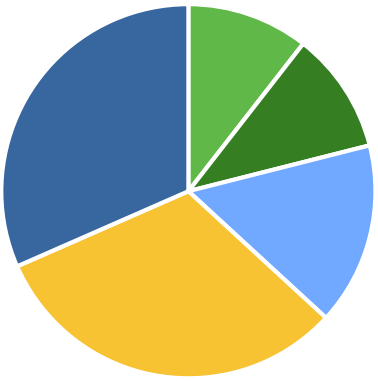

Which do you agree with? Select all that apply
When no occupancy is detected in a subzone, it is acceptable to turn off lights in that portion of an open plan office when anyone is in the rest of the office space.
Dimming to 20% of light output will be noticeable and render the space less inviting
Occupancy sensing in relatively small (20 x 20 ft zones) will have problems with sensor interference
Occupant sensing in small zones will provide more accurate control as small motions will be easier to pick up
Full off control of the entire open plan offices should allow inclusion of occupancy of nearby enclosed offices
Full off control of 8' wide path of egress in open plan office near enclosed offices also being controlled by occupancy of the enclosed offices.
Full off control should allow the option of 8' wide egress pathways in open plan offices near enclosed offices being controlled by a timeclock

Poll 9:


Which comments do you agree with for the proposed open plan office control, NOT considering DR or daylighting control? Select all that apply.
Control is possible to be implemented with stand-alone occupancy controls (on/off controls)
Control is possible to be implemented with stand-alone dimming occupancy controls (20% dimming and occ sensors tied together to turn off lights)
Control is difficult with luminaire level lighting controls unless on-board occupancy sensors are turning lights on/off or if timeclock is used for full off.
Control is difficult to implement without a lighting control panel (central panel combines control signals for groups of luminaires)
Control is difficult to implement without a networked control system (each luminaire could be controlled by different combinations of controls)

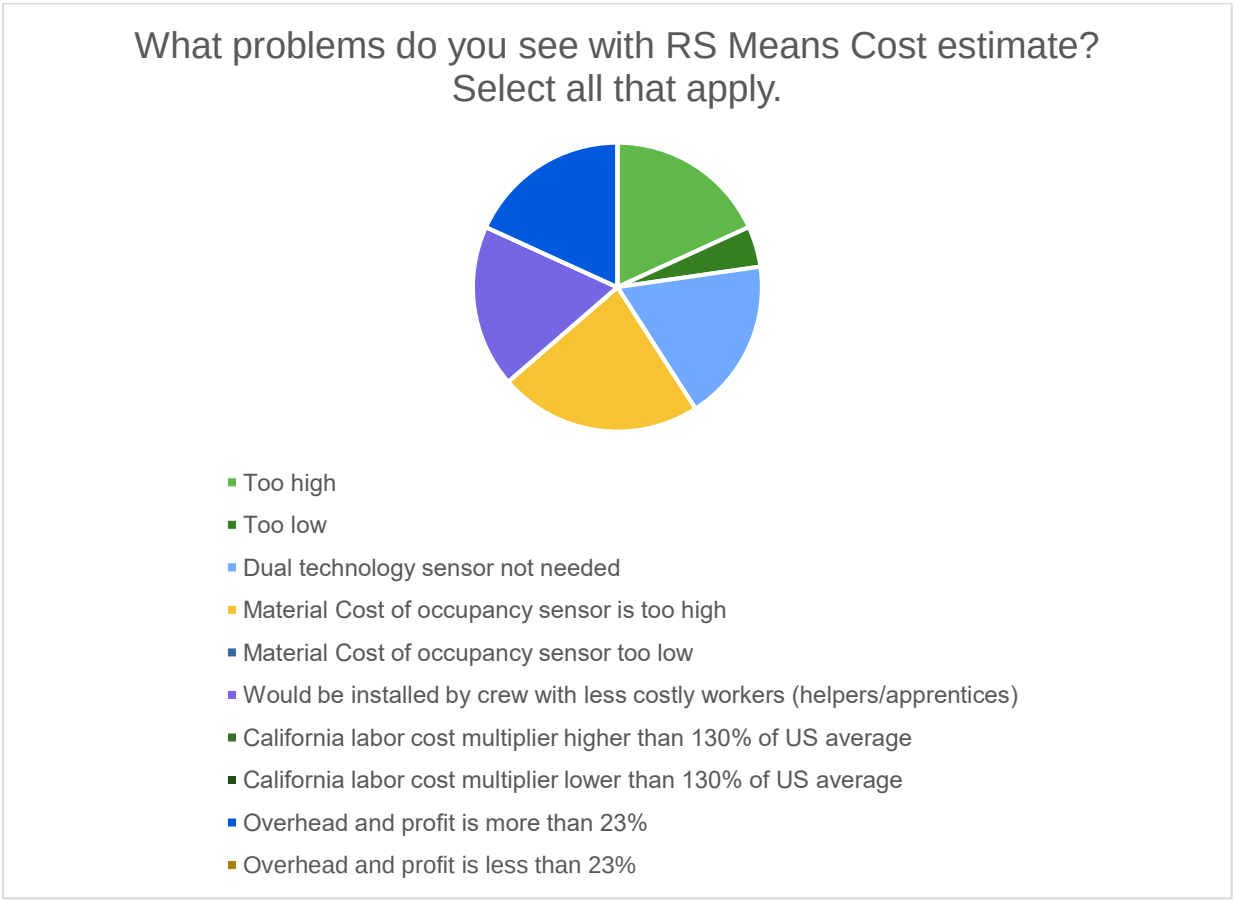
Poll 10:

Which comments do you agree with for the proposed open plan office control when INCLUDING DR and DAYLIGHTING control? Select all that apply.



- Control is possible to be implemented with stand-alone occupancy controls (on/off controls)
- Control is possible to be implemented with stand-alone dimming occupancy controls (20% dimming and occ sensors tied together to turn off lights)
- Control is difficult with luminaire level lighting controls unless on-board occupancy sensors are turning lights on/off or if timeclock is used for full off.
- Control is difficult to implement without a lighting control panel (central panel combines control signals for groups of luminaires)
- Control is difficult to implement without a networked control system (each luminaire could be controlled by different combinations of controls)

Poll 11:


What problems do you see with RS Means Cost estimate? Select all that apply.
Too high
Too low
Dual technology sensor not needed
Material Cost of occupancy sensor is too high
Material Cost of occupancy sensor too low
Would be installed by crew with less costly workers (helpers/apprentices)
California labor cost multiplier higher than 130% of US average
California labor cost multiplier lower than 130% of US average
Overhead and profit is more than 23%
Overhead and profit is less than 23%