

DOCKETED

Docket Number:	19-BSTD-03
Project Title:	2022 Energy Code Pre-Rulemaking
TN #:	234874
Document Title:	September 22 Presentation - 2022 Pre-Rulemaking for Building Energy Efficiency Standards
Description:	September 22 - 2022 Pre-Rulemaking for Building Energy Efficiency Standards workshop presentation for Nonresidential Daylighting and Nonresidential Outdoor Sources proposals
Filer:	Haile Bucaneg
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2022 Pre-Rulemaking for Building Energy Efficiency Standards

Payam Bozorgchami, P.E.

September 22, 2020

Start Time: 9:00 AM

What We Will Cover Today

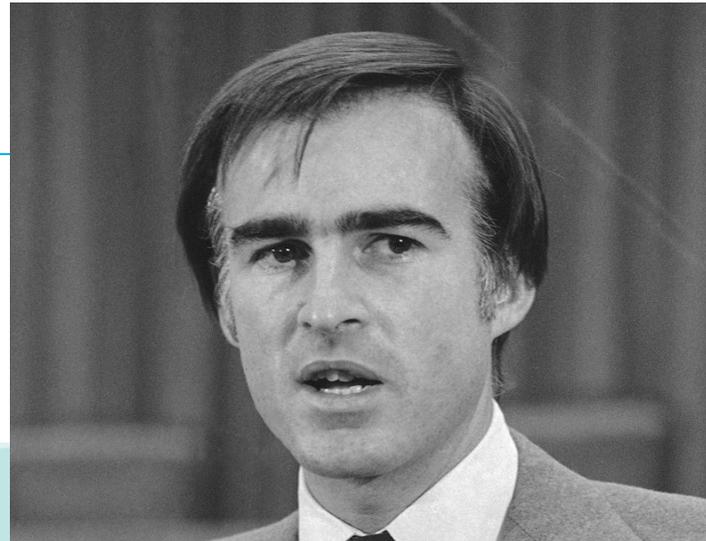
- Some Basic, Background
- How Title 24, Part 6 is Developed
- **Simon Lee, P.E.**
 - Nonresidential Daylighting controls
 - Nonresidential Outdoor Lighting
 - Reclassification of Lighting Zones
 - Adjustments to Outdoor Lighting Power Allowances
 - New section for Multifamily Outdoor Lighting



Authority & Process

•**Public Resources Code (PRC 25402):** Reduction of wasteful, uneconomic, inefficient, or unnecessary consumption of energy

- (a)(1) Prescribe, by regulation, lighting, insulation, climate control system, and other building design and construction standards that increase the efficiency in the use of energy and water...
- Warren Alquist Act Signed into law in 1974 by Governor Ronald Reagan and launched by Governor Jerry Brown in 1975 which mandates updates Building Efficiency Standards and requires the building departments to enforce them through the permit process.



Goals of the California Energy Code

1. Increase building energy efficiency cost-effectively
2. Contribute to the state's GHG reduction goals
3. Enable pathways for all-electric buildings
4. Reduce residential building impacts on the electricity grid
5. Promote demand flexibility and self-utilization of PV generation
6. Provide tools for local government reach codes



Process Used to Updated Energy Codes

CEC staff, with input from utility partners and industry stakeholders, develop the triennial standards update

Opportunities for participation

- Utility-Sponsored Stakeholder Meetings
- CEC-Sponsored Workshops

Standards must be cost-effective

- Life-Cycle Costing Methodology
- Time Dependent Valuation (TDV)



2022 Standards Process

2022 STANDARDS UPDATE SCHEDULE	
DATE	MILESTONES
November 2018 - November 2019	Updated Weather Files
November 2018-December 2019	Metric Development
November 2018-July 2019	Measures Identified and approval
August 2019 to October 2020	Stakeholder meeting/workshop & final staff workshop
August 2020-October 2020	CASE Reports submitted to the CEC
February 2021	45-day Language Hearings
July 2021	Adoption of 2022 Standards at a Business Meeting
July 2021 to November 2021	Staff work on Software, Compliance Manuals, Electronic Documents Available to Industry
December of 2021	Approval of the Manuals
January 2022	Software, Compliance Manuals, Electronic Documents Available to Industry
January 1, 2023	Effective Date



Tentative Pre-Rulemaking Schedule

❖ September 1

- Energy Savings and Process Improvements for Alterations and Additions
 - Roof deck insulation for low-slope roofs
 - Prescriptive attic insulation for alterations
 - Prescriptive duct sealing
 - Electric resistance water heating
 - Electric resistance space heating
 - 40-ft trigger for prescriptive duct requirements
 - Cool roof for steep-slope roofs
 - Cool roof for low-slope roof

❖ September 9

- Nonresidential Grid Integration
- Controlled Receptacle, CEA Proposal

❖ September 10

- Verification Testing

❖ September 22

- Outdoor lighting
- Daylighting

❖ September 23

- Computer Room Efficiencies
- Pipe Sizing and Leak Testing for Compressed Air Systems
- Refrigeration System Operation



Tentative Pre-Rulemaking Schedule (Cont.)

❖ September 30

- Indoor Air Quality Roundtable discussion with the outside world

❖ October 6 and November 17

- Solar Photo Voltaic and Electrification
- Multifamily All Electric

❖ October 7

- Nonresidential Indoor Lighting
- Air Distribution
- Nonresidential HVAC Controls

❖ October 13

- Multifamily Domestic Hot Water
- Multifamily Restructuring

❖ October 20

- Nonresidential High Performance Envelope

❖ October 27

- ❖ Control Environmental Horticulture
- ❖ New Construction Steam Trap

❖ October 29 Place holder (May get pushed backed based on the Roundtable results from the September 30

- Indoor Air Quality Roundtable discussion with the outside world



Key Web-Link

2022 Title 24 Utility-Sponsored Stakeholder

<http://title24stakeholders.com/>

Building Energy Efficiency Program

<http://www.energy.ca.gov/title24/>

Comments to be submitted to:

<https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=19-BSTD-03>

**NOTE: For this workshop comments To Be Submitted
By October 6, 2020**



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Comments For Today's Workshop

Due Date October 6, 2020 By 5:00 PM

Comments to be submitted to:

<https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=19-BSTD-03>



Questions?





Contact Information

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Thank You!



Daylighting Proposal for 2022

Staff Pre-Rulemaking Workshop



Presenters: Simon Lee, Electrical Engineer

Date: September 22, 2022



Proposal Summary

Nonresidential Daylighting Controls

Two sub-measures:

- Daylight Dimming to 10 percent
- Relocating secondary sidelit daylit zone requirements from prescriptive to mandatory

Supplementary changes associated with daylighting:

- PAF for daylighting continuous dimming controls
- New option for daylighting controls acceptance test



2022 Code Update Sections Affected

Building Energy Efficiency Standards for Residential and Nonresidential Buildings:

- Section 130.1(d)
- Section 140.6(a)2H
- Section 140.6(d)
- Section 100.1

Reference Appendix

- NA 7.6.1

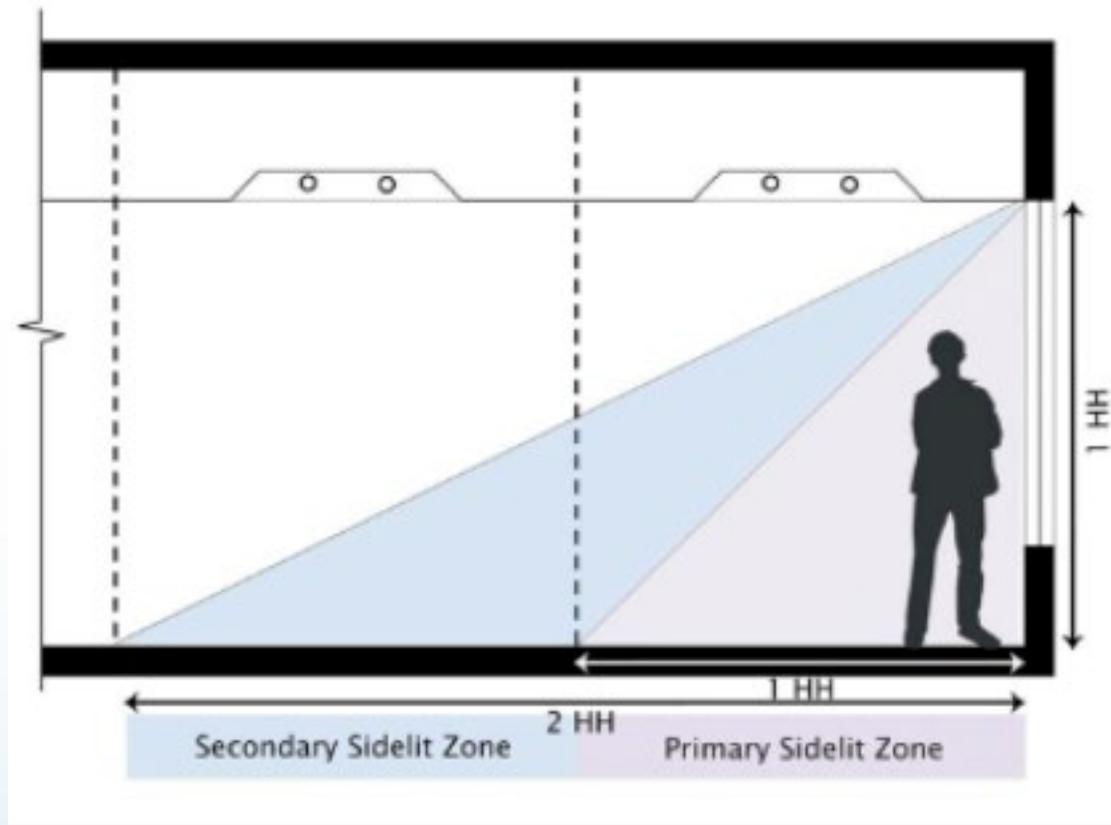


Automatic Daylighting Controls



Automatic Daylighting Controls

Daylighting, Electric Lighting, Energy





Daylight Dimming to 10 percent

Require controlled luminaires to dim down to 10 percent of lighting power when there are abundance of daylight.

- to leverage LED luminaires, their capability in dimming range 10-100 percent that is already required for LED luminaires and light sources in Table 130.1-A.



Proposal Language – Daylight Dimming to 10 percent

Section 130.1

(d) Automatic Daylighting Controls.

3. The automatic daylighting controls shall:

C. ... , the general lighting power in that daylight zone shall be reduced by a minimum of ~~65~~ 90 percent; and



Secondary Sidelit Daylit Zones

Move “Secondary Sidelit Daylit Zones” to Mandatory Automatic Daylighting Controls of Section 130.1(d).

- mandatory to install automatic daylighting controls in all applicable secondary sidelit daylit zones.
- does not affect parking lots.
- does not affect retail merchandise and wholesale showroom rooms.



Secondary Sidelit Daylit Zones

Section 130.1(d)

Automatic Daylighting Controls. The general lighting in skylit daylit zones, primary sidelit daylit zones **and secondary sidelit daylit zones**, ... , shall provide controls that automatically adjust the power of the installed up and down to keep the total light level stable ...

All **daylit zones** and the combined primary and secondary sidelit daylit zones in parking garages shall be shown on the plans.



PAF for Daylighting Controls

Update the PAF credit for daylight dimming plus off to be based on LED lighting technology.

Daylight continuous dimming Controls

- a continuous dimming controls that varies the luminous flux in response to available daylight.
- Daylight stepped dimming controls would no longer be qualified for this PAF.



Questions



Acceptance Testing for Daylighting Controls

New option and method to improve the procedure for:

- Full Daylight Test
- Partial Daylight Test



Acceptance Testing for Daylighting Controls

Full Daylight Test

- Simulate by **shining a bright light into the daylight** sensor.
- Lighting power reduction is at least **90** percent under fully dimmed conditions.



Acceptance Testing for Daylighting Controls

An Alternate Partial Daylight test

Prerequisites:

- Outdoor horizontal illuminance is at least 4000 fc; and
- Interior Daylight illuminance at Reference Location is no greater than 95 percent of Reference Illuminance (Design Illuminance)

Test Outlines:

1. Take a measurement of the Combined daylight and electric lighting illuminance (Combined Illuminance) at Reference Location
2. Pass if the measured value is within the range:
Reference Illuminance \leq measured value \leq Max. Combined Illuminance



Acceptance Testing for Daylighting Controls

Partial daylight test

The recommended outdoor horizontal illuminance is proposed and developed based on CIE clear sky model.

Hour	Total Horizontal Illuminance on Winter Solstice (fc)	Total Horizontal Illuminance on Fall and Spring Equinox (fc)	Total Horizontal Illuminance on Summer Solstice (fc)
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	372
7	0	1,040	1,784
8	644	3,093	3,840
9	2,066	5,118	5,889
10	3,430	6,762	7,696
11	4,348	7,869	9,113
12	4,699	8,353	10,036
13	4,447	8,178	10,400
14	3,618	7,357	10,181
15	2,313	5,953	9,393
16	841	4,082	8,091
17	0	1,968	6,370
18	0	362	4,365



Estimated Cost for Implementation

- No incremental first cost
- No incremental maintenance or replacement cost.

Typical Components of automatic daylighting control systems	Preliminary Findings
Photocells	No change in equipment from the current requirements
Daylighting logic controllers	No change in equipment from the current requirements
Power controllers	Those that dim to 10 percent is expected to be standard. LED technology is the baseline lighting technology.



Benefits for Implementation

Statewide Energy and Energy Cost Impacts

Construction Type	First-Year Electricity Savings (GWh)	First-Year Peak Electrical Demand Reduction (MW)	First -Year Natural Gas Savings (million therms)	15-Year Present Valued Energy Cost Savings (PV\$ million in 2023)
New Construction	12.6	0.2	(0.0859)	\$24.4
Additions and Alterations	42.9	0.6	(0.2825)	\$83.2
TOTAL	55.5	0.8	(0.3684)	\$107.6



Greenhouse Gas (GHG) Emissions Reduction

First-Year Statewide GHG Emissions Impacts

Measure	Electricity Savings (GWh/yr)	Reduced GHG Emissions from Electricity Savings (Metric Tons CO ₂ e)	Natural Gas Savings ^a (million therms/yr)	Reduced GHG Emissions from Natural Gas Savings (Metric Tons CO ₂ e)	Total Reduced CO ₂ e Emissions (Metric Tons CO ₂ e)
Daylighting Dimming to 10%	55.5	13,340	(0.3)	(1,824)	11,516



Preliminary Findings

Technical Feasibility

- Daylighting controls products are readily available for usage in daylighting applications in buildings.
- Daylighting controls has been a lighting control requirement in California Energy Code since 2005.

Cost Effectiveness

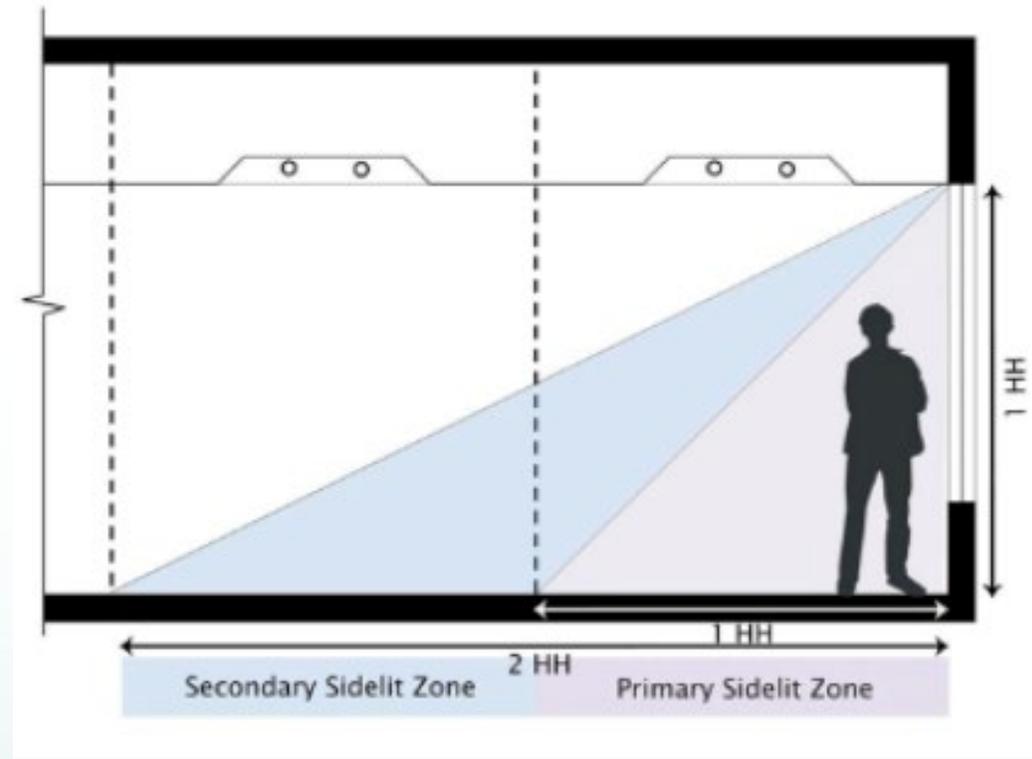
- Cost effective in all climate zones.
- Cost effective in all proposed building types.



Daylighting, Electric Lighting, Energy



(source: website at www.windows.lbl.gov;
windows and daylighting)





Questions



Comments for Today's Workshop

Due Date: October 6, 2020 By 5:00 PM

Comments to be submitted to:

<https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=19-BSTD-03>



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Thank You!



Outdoor Lighting Proposal for 2022

Staff Pre-Rulemaking Workshop



Presenters: Simon Lee, Electrical Engineer

Date: September 22, 2020



Proposal Summary

Nonresidential Outdoor Lighting

The proposal contained three primary measures:

- Reclassification of nonresidential lighting zones
- Adjustments to nonresidential outdoor Lighting Power Allowances
- Creation of a separate code section for multi-family outdoor lighting



Sections Affected – Outdoor Lighting

- Part 6 Sections
 - Section 10-114
 - Table 10-114-A
 - Section 100.1
 - Section 130.2
 - Section 140.7
 - Table 140.7-A
 - Table 140.7-B
- Reference Appendix sections
 - N/A
- A new code section in Title 24, Part 6, will be introduced for multifamily outdoor lighting requirements.
- Existing requirements in Sections 130.2, 140.7 and 150.0(k)3 relating to multifamily buildings will be relocated to the new code section.



Reclassification of Lighting Zones



Reclassification of Lighting Zones

- Rural areas are moved from a default Lighting Zone of 2 to 1.
- A new census classification, urban clusters, receives a default Lighting Zone of 2.
- Building types likely to occur in each zone are added to Table 10-114.
- The conditions for designating a higher or lower lighting zone are revised.



Reclassification of Lighting Zones

Example Text: Table 10-114-A

Zone	Statewide Default Location	Moving Up to Higher Zones	Moving Down to Lower Zones
LZ1	<p>Rural areas, as defined by the 2010 U.S. Census. These areas include: single or dual family residential areas, parks, and agricultural zone districts, developed portion of government designated parks, recreation areas, and wildlife preserves. Those that are wholly contained within a higher lighting zone may be considered by the local government as part of that lighting zone.</p>	<p>Retail stores, located in a residential neighborhood, and rural town centers, as defined by the 2010 U.S. Census, can be designated as LZ2 if the business operates during hours of darkness.</p> <p>Developed portion of government designated parks, recreation areas, and wildlife preserves. can be designated as LZ2 or LZ3 if they are contained within such a zone.</p>	Not applicable



Reclassification of Lighting Zones

Example Text: Table 10-114-A

Zone	Statewide Default Location	Moving Up to Higher Zones	Moving Down to Lower Zones
LZ2	<p>Rural areas as defined by the 2010 U.S. Census. The following building types are likely to occur here: multifamily housing, mixed use residential neighborhoods, religious facilities, schools, and light commercial business districts or industrial zoning districts.</p>	<p>Special districts within a default LZ2 zone may be designated as LZ3 or LZ4 by a local jurisdiction. Examples include special commercial districts or areas with special security considerations located within a mixed-use residential area or city center rural areas.</p>	<p>Special districts and government designated parks within a default LZ2 zone maybe designated as LZ1 by the local jurisdiction for lower illumination standards, without any size limits.</p>



Reclassification of Lighting Zones

Example Text: Table 10-114-A

Zone	Statewide Default Location	Moving Up to Higher Zones	Moving Down to Lower Zones
LZ3	Urban areas as defined by the 2010 U.S. Census. The following building types are likely to occur here: high intensity commercial corridors, entertainment centers, and heavy industrial or manufacturing zone districts.	Special districts within a default LZ3 zone may be designated as LZ4 by a local jurisdiction for a high intensity nighttime use, such as entertainment or commercial district or areas with special security considerations requiring very high light levels.	Special districts and government designated parks maybe designated as LZ1 or LZ2 by the local jurisdiction without any size limits.



Census Classifications

- **Rural areas** - include all population, housing, and territory not included within an urban area.
- **Urbanized Areas (UAs)** - territories with 50,000 or more people
- **Urban Clusters (UCs)** - territories with at least 2,500 and less than 50,000 people.

Source: U.S. Census webpage on urban and rural classification. Link:

<https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural/2010-urban-rural.html>



Estimated Cost for Implementation

Reclassification of Lighting Zones

Cost to implement the measure:

- No incremental first costs
- No incremental maintenance and replacement cost



Benefits for Implementation

Statewide Energy and Energy Cost Impacts - Reclassification of Lighting Zones

Construction Type	First-Year Electricity Savings (GWh)	First-Year Peak Electrical Demand Reduction (MW)	First -Year Natural Gas Savings (million therms)	15-Year Present Valued Energy Cost Savings (PV\$ million in 2023)
New Construction	0.69	0.11	N/A	\$1.86
Additions and Alterations	2.13	0.34	N/A	\$5.74
TOTAL	2.82	0.45	N/A	\$7.60



Greenhouse Gas (GHG) Emissions Reduction

First-Year Statewide GHG Emissions Impacts

Measure	Electricity Savings (GWh/yr)	Reduced GHG Emissions from Electricity Savings (Metric Tons CO ₂ e)	Natural Gas Savings ^a (million therms/yr)	Reduced GHG Emissions from Natural Gas Savings (Metric Tons CO ₂ e)	Total Reduced CO ₂ e Emissions (Metric Tons CO ₂ e)
Reclassification of Lighting Zones	2.82	676.91	N/A	N/A	676.91
General Hardscape LPA	24.30	5,841.46	N/A	N/A	5,841.46
Multifamily Outdoor LPA	11.75	2,812.68	N/A	N/A	2,812.68
TOTAL	38.87	9,331	N/A	N/A	9,331



Preliminary Findings

Reclassification of Lighting Zones

Technical Feasibility

- Continuation with a population-based approach for lighting zone classifications
- Local jurisdictions can designate areas to a lower or higher lighting zones with the same process.

Cost Effectiveness

- Cost effective in all climate zones
- Cost effective in all building types



Staff Questions – Reclassification of Lighting Zones

- Will the introduction of the Census-based-default LZ of urban/rural area reclassification possibly be out of unison to any area classification from local development plan or zoning map?
- Will providing more discretion to local jurisdictions be enough to address this issue?
Pros: Local jurisdictions could use granted authority to determine appropriate lighting zones for specific projects or regions, if they can do so without needing to file materials with the CEC.



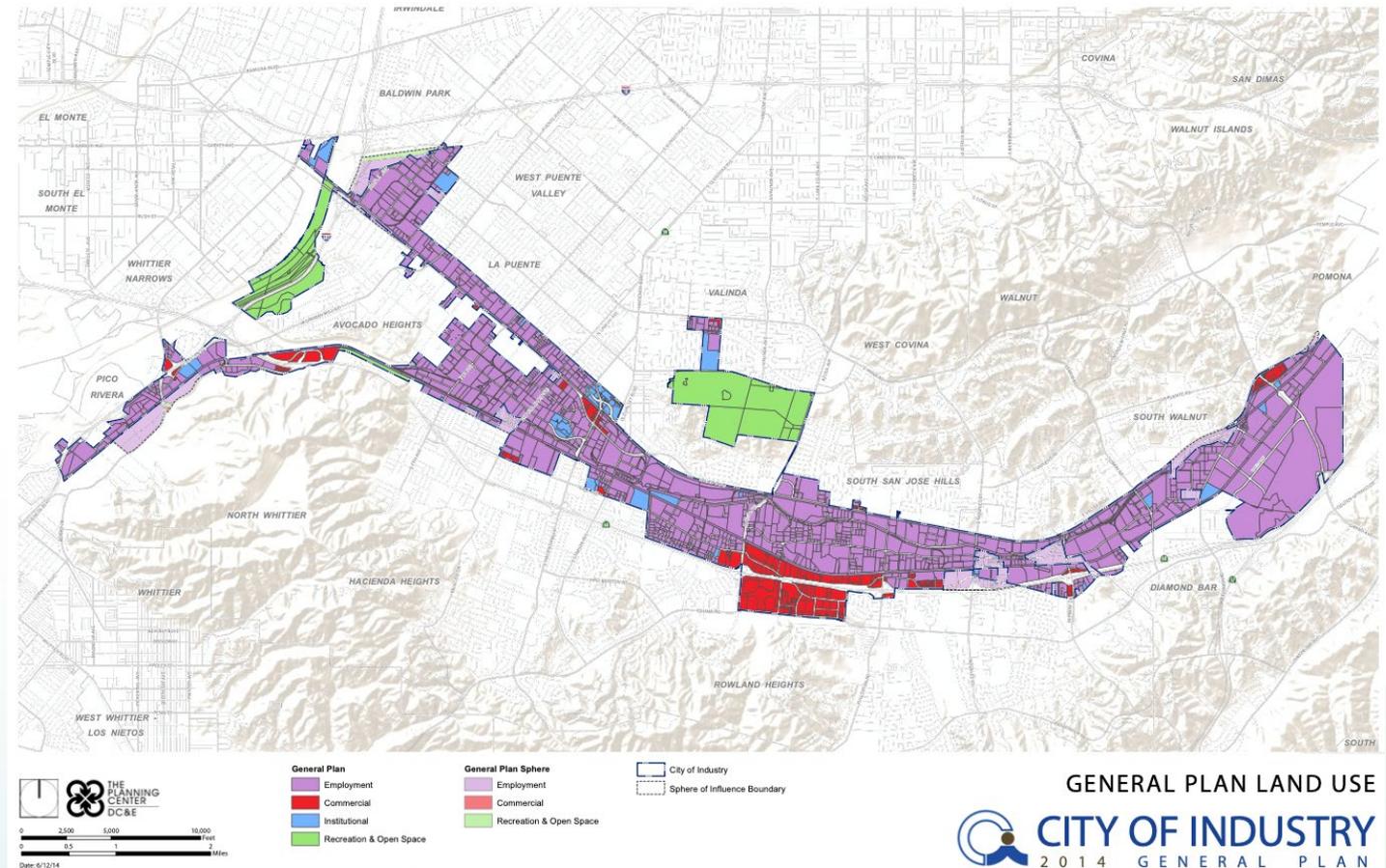
Staff Questions – Reclassification of Lighting Zones (Continue)

- Will the move to LZ result in underlighting?
 - Census blocks can be fairly large, and there can be areas of dense development within a less populous region.
 - There are jurisdictions, such as the City of Industry, City of Vernon, and City of Irwindale that are focused on commercial or industrial development and are comprised of highly urbanized areas despite having low population.



Example - City of Industry

- 3,000 businesses and 67,000 jobs, approximately
- 219 residents (2010 Census)
- Very heavily urbanized
- May need outdoor lighting for industrial and commercial operations during nighttime
- Lighting zone would be changed from LZ3 to LZ1.

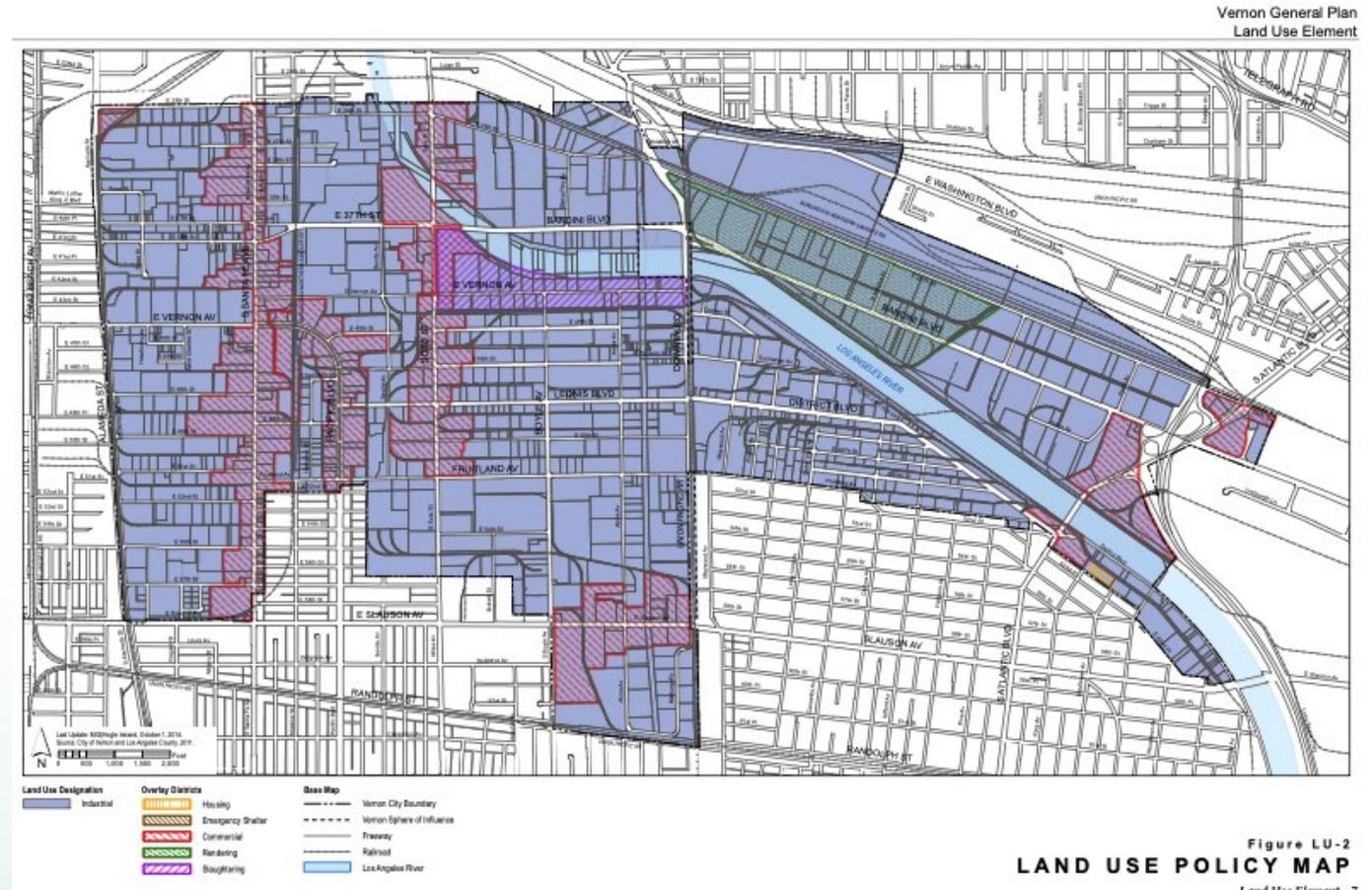


(source: city website at www.cityofindustry.gov; 2010 Census)



Example - City of Vernon

- 1,800 businesses and 55,000 jobs, approximately
- 112 residents (2010 Census)
- Primarily composed of industrial areas
- Lighting zone would be changed from LZ3 to LZ1.



(source: city website at www.cityofvernon.gov; 2010 Census)



Questions



General Hardscape Lighting Power Allowances



General Hardscape Lighting Power Allowances

Align the outdoor lighting power allowance with the recommended illuminance values for parking lots

- Outdoor lighting power allowances are based on the recommended illuminance values of Illumination Engineering Society
- Addendum 1 of IES RP-8-18 Chapter 17 was published on February 2020
- Align the proposed outdoor lighting power allowance values in Table 140.7-A with the recommended illuminance values in the new Addendum.



General Hardscape Lighting Power Allowances

Highlights of the proposed changes:

- Establishes one set of lighting power allowance values for parking lot facilities at a level suitable for both asphalt and concrete surface.
- A new lighting power allowance is added for general hardscape lighting applications with security cameras.
- The term “cutoff” is replaced with “shielding”



Proposed Language

Example language: Table 140.7-A

Types of lighting power allowance	Lighting Zone LZ0	LZ1	LZ2	LZ3	LZ4
Area Wattage Allowance	No allowance	0.016 W/ft ² 0.018	0.019 W/ft ² 0.023 /0.025	0.021 W/ft ² 0.025 /0.03	0.024 W/ft ² 0.03
Linear Wattage Allowance	No allowance	0.13 W/ft 0.15	0.15 W/ft 0.17 /0.4	0.20 W/ft 0.25 /0.4	0.29 W/ft 0.35
Initial Wattage Allowance	No allowance	150 W 180	200 W 250	250 W 350	320 W 400



Proposal Language

Example language: Table 140.7-B

Lighting Applications	LZ0	LZ1	Lighting Zone 2, 3, 4
Security Camera. This additional allowance is for the illuminated general hardscape area. This allowance shall apply when a security camera is installed within 2 mounting heights of the general hardscape area and mounted more than 10 feet away from a building.	Not applicable	No Allowance	0.018 W/ft ²

New definition: **Security cameras** are any operational camera used to enhance the safety and security within a general hardscape area.



Estimated Cost for Implementation

General Hardscape Lighting Power Allowances

Cost to implement the measure:

- No incremental first cost
- No incremental maintenance or replacement cost



Benefits for Implementation

Statewide Energy and Energy Cost Impacts - General Hardscape Lighting Power Allowance

Construction Type	First-Year Electricity Savings (GWh)	First-Year Peak Electrical Demand Reduction (MW)	First -Year Natural Gas Savings (million therms)	15-Year Present Valued Energy Cost Savings (PV\$ million in 2023)
New Construction	5.91	0.76	N/A	\$15.70
Additions and Alterations	18,40	2.35	N/A	\$48.89
TOTAL	24.30	3.11	N/A	\$64.58



Greenhouse Gas (GHG) Emissions Reduction

First-Year Statewide GHG Emissions Impacts

Measure	Electricity Savings (GWh/yr)	Reduced GHG Emissions from Electricity Savings (Metric Tons CO ₂ e)	Natural Gas Savings ^a (million therms/yr)	Reduced GHG Emissions from Natural Gas Savings (Metric Tons CO ₂ e)	Total Reduced CO ₂ e Emissions (Metric Tons CO ₂ e)
Lighting Zone Reclassification	2.82	676.91	N/A	N/A	676.91
General Hardscape LPA	24.30	5,841.46	N/A	N/A	5,841.46
Multifamily Outdoor LPA	11.75	2,812.68	N/A	N/A	2,812.68
TOTAL	38.87	9,331	N/A	N/A	9,331



Preliminary Findings

General Hardscape Lighting Power Allowance Measure

Technical Feasibility

- LED luminaires useful for achieving revised default lighting levels are widely available
- Builders and designers are familiar with available products – no novel technologies or techniques are required

Cost Effectiveness

- Cost effective in all climate zones
- Cost effective in all building types



Staff Questions - General Hardscape Lighting Power Allowance

Q: The outdoor lighting power allowance values are developed to provide sufficient lighting power to cater for the recommended illuminance level. Are there any other illuminance levels that should be considered (besides those in the CASE report and its appendices)?



Questions



Multifamily Outdoor Lighting



Proposal Description

New Section for Multifamily Outdoor Lighting

Overall Restructuring

- A new dedicated chapter for multifamily; a new section for multifamily outdoor lighting
- Consolidates existing outdoor lighting provisions applicable to multifamily buildings
- Provides consistency between overlapping residential and nonresidential requirements



Proposal Language (Relocation)

Example language, Section 130.0:

(a) The design and installation of all lighting systems and equipment in nonresidential, high-rise residential, hotel/motel buildings, outdoor lighting, and electrical power distribution systems within the scope of Section 100.0(a) shall comply with the applicable provisions of Sections 130.0 through 130.5.

EXCEPTION to Section 130.0(a): Outdoor lighting for high-rise residential buildings.

Example language, Section 130.2:

Outdoor Lighting Controls and Equipment. Nonresidential, ~~high-rise residential~~ and hotel/motel buildings shall comply with the applicable requirements of Sections 130.2(a) through 130.2(c).



Proposal Language (Relocation)

Example language, Section 150.0(k)3:

- B. For ~~low-rise residential buildings with four or more dwelling units,~~ outdoor lighting for private patios, entrances, balconies, porches; and residential parking lots and carports with less than eight vehicles per site shall comply with either:
- i. Section 150.0(k)3A; or
 - ii. the Multifamily Outdoor Lighting Section. ~~The applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.~~
- C. For ~~low-rise residential buildings with four or more dwelling units,~~ any outdoor lighting for residential parking lots or carports with a total of eight or more vehicles per site and any outdoor lighting not regulated by Section 150.0(k)3B or the Multifamily Outdoor Lighting Section ~~150.0(k)3C~~ shall ~~comply with the applicable requirements in Sections 110.9, 130.0, 130.2, 130.4, 140.7 and 141.0.~~



Multifamily Outdoor Lighting

Highlights of the to outdoor multifamily lighting proposal:

- Allow mixed-use buildings (properties) with residential dwelling units to use the new section
- Simplify calculation of the allowed outdoor lighting wattage for multifamily buildings
- A single, common allowance for canopy lighting
- Setback control requirements will apply – to reduce outdoor lighting power by at least 60 percent
- Exception to lighting for public streets and roadways - including those owned or maintained by municipality or utility



Proposal Language (Multifamily)

Example language: TABLE X - General Hardscape Lighting Power Allowance For Multifamily Buildings

Types of power allowance	Lighting Zone LZ 0	LZ 1	LZ 2	LZ 3	LZ 4
Area Wattage Allowance (AWA)	No allowance	0.026 W/ft ²	0.030 W/ft ²	0.038 W/ft ²	0.055 W/ft ²
Initial Wattage Allowance (IWA)	No allowance	300 W	350 W	400 W	450 W



Proposal Language (Multifamily)

Example language, Section X:

EXCEPTIONS:

3. Lighting for public streets, roadways, highways, and traffic signage lighting, including lighting for driveway entrances occurring in the public right-of-way **owned or maintained by the local municipality or utility.**

~~Lighting for industrial sites, including but not limited to, rail yards, maritime shipyards and docks, piers and marinas, chemical and petroleum processing plants, and aviation facilities.~~

~~In theme parks: outdoor lighting only for themes and special effects.~~



Estimated Cost for Implementation

Multifamily Outdoor Lighting Power Allowances

Cost to implement the measure:

- No or zero incremental first costs
- No or zero incremental maintenance and replacement cost



Benefits for Implementation

Statewide Energy and Energy Cost Impacts – Multifamily Outdoor Lighting Allowance

Construction Type	First-Year Electricity Savings (GWh)	First-Year Peak Electrical Demand Reduction (MW)	First -Year Natural Gas Savings (million therms)	15-Year Present Valued Energy Cost Savings (PV\$ million in 2023)
New Construction	2.28	0.45	N/A	\$1.89
Additions and Alterations	9.47	1.85	N/A	\$7.84
TOTAL	11.75	2.30	N/A	\$9.73



Greenhouse Gas (GHG) Emissions Reduction

First-Year Statewide GHG Emissions Impacts

Measure	Electricity Savings (GWh/yr)	Reduced GHG Emissions from Electricity Savings (Metric Tons CO ₂ e)	Natural Gas Savings ^a (million therms/yr)	Reduced GHG Emissions from Natural Gas Savings (Metric Tons CO ₂ e)	Total Reduced CO ₂ e Emissions (Metric Tons CO ₂ e)
Lighting Zone Reclassification	2.82	676.91	N/A	N/A	676.91
General Hardscape LPA	24.30	5,841.46	N/A	N/A	5,841.46
Multifamily Outdoor LPA	11.75	2,812.68	N/A	N/A	2,812.68
TOTAL	38.87	9,331	N/A	N/A	9,331



Preliminary Findings

Multifamily Outdoor Lighting Power Allowance Measure

Technical Feasibility

- LED luminaires useful for achieving revised lighting levels are widely available
- Builders and designers are familiar with available products – no novel technologies or techniques are required

Cost Effectiveness

- Cost effective in all climate zones



Questions



Comments for Today's Workshop

Due Date October 6, 2020 By 5:00 PM

Comments to be submitted to:

<https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=19-BSTD-03>



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Thank You!

