CALIFORNIA ENERGY CODES & STANDARDS

A STATEWIDE UTILITY PROGRAM

Stakeholder Meeting for:

Advanced Daylighting Design

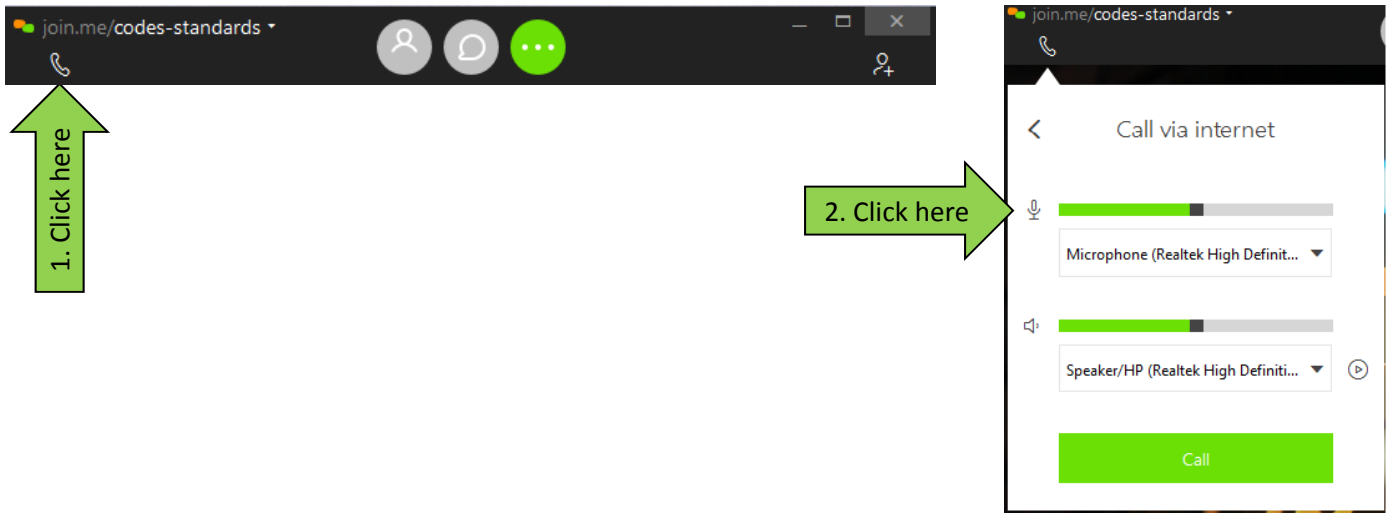
December 15, 2016
1:00 – 4:00 PM PST

URL: https://join.me/codes-standards
Phone: (415) 655-0381 Access Code: 940-290-811#

Pacific Gas and Electric Company® | Southern California Edison An EDISON INTERNATIONAL® Company | SoCalGas A Sempra Energy utility | SDGE A Sempra Energy utility® | SMUD | LA DWP Los Angeles Department of Water & Power

Meeting Ground Rules

- Phone rules
  - Please mute your microphone, unless you want to speak
  - Please do not place your phone on HOLD
  - Ask questions/comment by “chat” in online meeting or by voice
  - To unmute your line:
    - If you called in on a phone, press *6
      - After speaking please mute yourself again by pressing *6
    - If you called in via internet



Meeting Ground Rules (continued)

- We want to hear your thoughts
  - Supporting and opposing viewpoints are welcome
  - We may not be able to reach resolutions today
- When making comments
  - Clearly state your name and affiliation prior to speaking
  - Speak loudly into the microphone for the people on the phone
- Calls are recorded for note development, however recordings will not be publicized
- Notes and presentation material will be posted on our website www.Title24Stakeholders.com

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Meeting Agenda

Time	Topic	Presenter
1:00 – 1:20	Introduction	Randall Higa (SCE)
1:20 – 1:30	Compliance Improvement	Javier Mariscal (SCE)
1:30 – 2:45	**Daylighting Topics Part 1** • Minimum Visible Transmittance for Tubular Daylighting Devices • Update skylit daylit zone definition	Mudit Saxena (Vistar Energy)
2:45 – 3:55	**Daylighting Topics Part 2** • Fixed slats • Daylight distribution devices • Daylight redistributing films • Automatic shades • Dynamic glazing • Clerestory windows	Eric Shadd (Determinant)
3:55 – 4:00	Wrap up and Adjourn	Randall Higa (SCE)

Statewide Utility Codes and Standards Team Support for 2019 Title 24 Code Cycle

- The Statewide Utility Codes and Standards Team is actively supporting the California Energy Commission (CEC) in developing the California Building Energy Efficiency Standard (Title 24, Part 6)
- Their joint intent is to achieve significant energy savings and demand response through the development of feasible, enforceable, cost-effective and non-proprietary code change proposals for the 2019 code update, and beyond
- At the request of the Energy Commission, the Statewide Utility Team is hosting stakeholder meetings to get industry input and feedback on our code change proposals
- For more information on the Energy Commission rulemaking, please visit: http://www.energy.ca.gov/title24/2019standards/index.html

Utility-Sponsored Stakeholder Meeting

- Utilities will be sponsoring public stakeholder meetings for all CASE topics
- All meetings can be attended remotely
- Please check www.Title24Stakeholders.com for information about upcoming meetings

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Utility-Sponsored Stakeholder Meetings

Date	Topic
First Round of Utility-Sponsored Stakeholder Meetings	
September 8, 2016	*Nonresidential Lighting*
September 14, 2016	*Residential Envelope*
September 26, 2016	*Nonresidential HVAC*
September 27, 2016	*Res and NR Ventilation/IAQ and Res HVAC*
October 11, 2016	*Res and NR Demand Response Clean-up*
October 26, 2016	*Water Heating*
December 12, 2016	*Warehouse Topics*
December 13, 2016	*Laboratory Topics*
December 15, 2016	Advanced Daylighting Design
Second Round of Utility-Sponsored Stakeholder Meetings	
February – March 2017	Multiple webinars – dates and times TBD

Objectives

- Discuss potential code change proposals
- Receive feedback on:
  - General concepts
  - Assumptions used in energy and cost analyses
  - Technical and market feasibility
  - Compliance and enforcement
- Feedback we receive will help inform the Utility Team's code change proposals
- How to provide feedback:
  - Participate in discussion today
  - Email feedback to info@title24stakeholders.com
  - Providing primary and secondary references (e.g., data, survey results, reports, etc.)

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Information Discussed for Each Code Change

- Summary of proposed code changes
- Regulatory framework for each proposed change
  - Existing Title 24 requirements
  - Model codes (ASHRAE, IECC, Local Ordinances)
- Methodology and findings to date
  - Energy and demand impacts
  - Cost effectiveness
  - Key assumptions used in analyses
- Strawman code requirements

Schedule: Key Dates (tentative)

Milestone	Dates
CEC Develops 2019 TDV	Complete
Utility Team Develops Code Change Proposals	Now – Q2 2017
Utilities Submit First Draft of CASE Reports to CEC	April 2017
Utilities Submit Final CASE Reports to CEC	June 2017
CEC Pre-rulemaking	June 2017 – Nov 2017
CEC Rulemaking	Nov 2017 – May 2018
2019 Standards Adopted	May 2018
2019 Compliance Manuals Approved	Nov 2018
Make Software, Compliance Manuals, Electronic Documents Available to Industry	January 2019
2019 Standards Effective	January 1, 2020

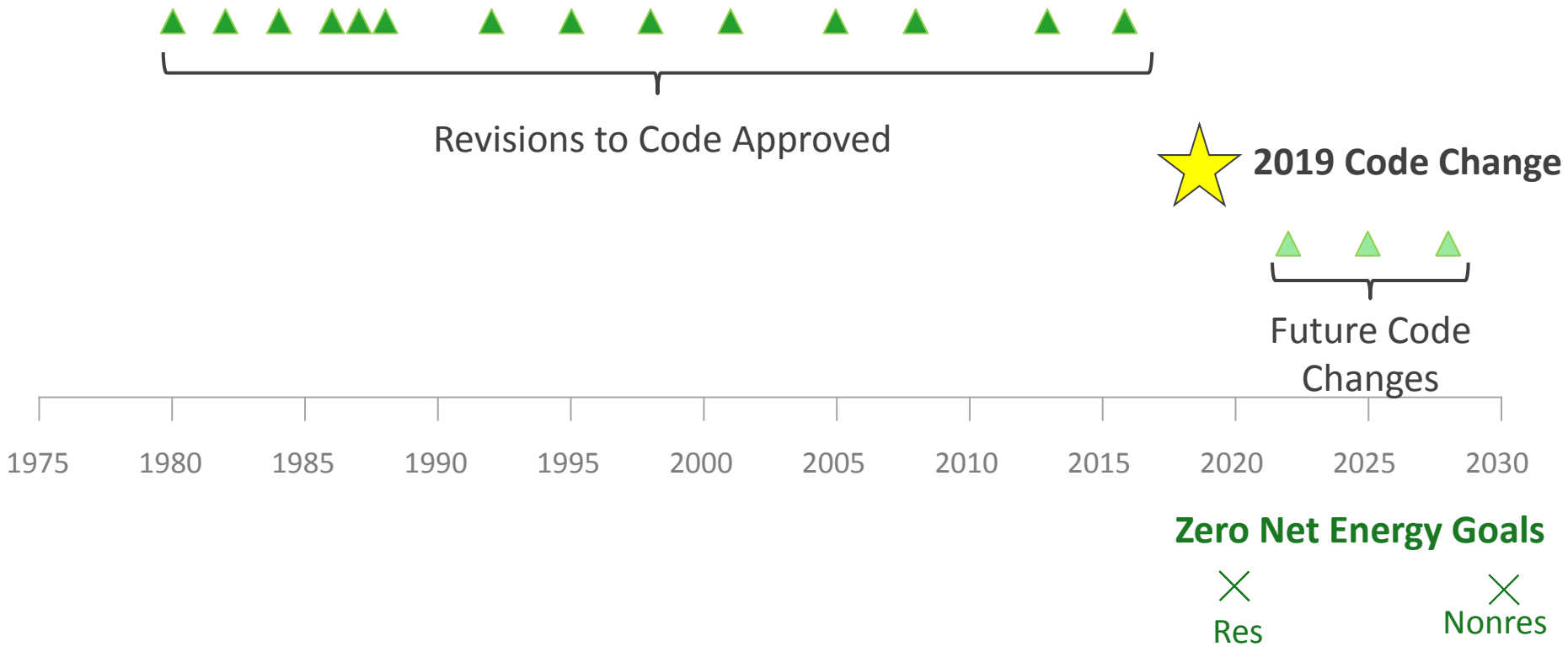
Warren-Alquist Act

- Enacted in 1974 (CA Assembly Bill 1575)
- Established California Energy Commission
- Instructed the CEC to establish building energy efficiency standards
  - Standards must be cost-effective in their entirety
  - CEC must report environmental impacts of proposed standards
- Established enforcement mechanism for building standards
- Provides for California utilities to participate in rulemaking process
- For more information of the Warren-Alquist Act, please visit http://www.energy.ca.gov/reports/Warren-Alquist_Act/

Brief History of Title 24

Warren-Alquist Act Adopted

First Building Energy Efficiency Standards Adopted



General Structure of Title 24

requirements for all buildings

Mandatory Measures
(required for all buildings)

+

Prescriptive Path
(additional measures)

or

Performance Path
(model building energy performance)

only required for some equipment and building types

Certification and Acceptance Requirements

Types of Code Change

- **Mandatory Requirements**
  - The change would add or modify a mandatory measure
  - Mandatory measures must be satisfied whether the prescriptive or performance method is used to show compliance
- **Prescriptive Requirement**
  - The change would add or modify a prescriptive requirement that must be met when using prescriptive compliance approach
  - In general, prescriptive requirements establish the “base case” energy budget that must be achieved if applicant is using performance method

Types of Code Change – Continued

- **Performance Credit / Compliance Option / Modeling Improvements**
  - The change would add or modify how an applicant achieves the required energy budget using the performance approach
  - May add new measure or modify an existing measure
  - Includes revisions to the modeling rulesets and assumptions used in the compliance software

Requirements for a Successful Code Change

- Mandatory and Prescriptive requirements satisfy all of the following:
  - Cost effective
    - Using CEC's Lifecycle Cost Methodology
  - Feasible
    - Capable of being implemented now or when the code goes into effect
    - Compatible with other California building codes
    - Maintains the key amenities of the building
  - Non-proprietary
    - Can be implemented using equipment that is readily available from multiple providers.
- Compliance options (performance method) or prescriptive credits (power adjustment factors) do not need to be cost-effective, nor be feasible in all instances.

Code change comparison

- Existing conditions:
  - If Title 24 Standard exists - 2016 Title 24 Standards
  - If no Title 24 Standard exists - current industry standard practices
- Proposed conditions – as proposed
- Incremental Costs, relative to existing conditions
  - Incremental installation cost
  - Incremental maintenance cost
  - *Design cost and cost of code verification not included*

Lifecycle Cost (LCC) Methodology

- Life Cycle Costing is basis of determining cost effectiveness
  - Cost Effective if Present Valued (PV) Benefit / Cost Ratio is > 1.
  - Includes incremental first cost, change in PV maintenance costs, change in PV replacement costs, and present valued (PV) energy cost savings
- Life Cycle Costing key assumptions:
  - 3 percent real discount rate
    - Applied to maintenance costs or equipment replacement during period of analysis
  - Period of analysis – varies by building type and measure
    - 30-year period of analysis for all low-rise residential measures and nonresidential envelope measures
    - 15-year period of analysis for nonresidential and high-rise residential equipment measures.
  - Time Dependent Valuation (TDV) hourly factors used to calculate the present value of energy cost savings over the period of analysis
    - Multiplied by hourly savings of electricity, natural gas, propane
    - Different factors depending upon res vs nonres and 15-year vs 30-year period of analysis (the 3 percent real discount rate is embedded in the TDV factors)
- If the proposal increases the present value of maintenance costs, then the change in maintenance costs is a “cost”, otherwise it is treated as a “benefit”
- The same approach is applied to equipment replacement

ASHRAE 90.1, IECC and Title 24

- Nonresidential state building efficiency standards must result in energy performance that is equal to or better than the ASHRAE 90.1 national model code.
- Low-rise residential state building efficiency standards must result in energy performance that is equal to or better than the IECC national model code.
- State building efficiency codes are compared against the national model codes as a whole, not measure-by-measure.
- Some ASHRAE 90.1, 189.1, and IECC standards are well-suited for California and are being considered for Title 24
- ASHRAE and IECC standards have been vetted by national stakeholder process

Energy Code Ace™

HELPING YOU PLAY YOUR CARDS RIGHT

A website developed by the Statewide Codes & Standards Program
to help you meet the requirements of Title 24, Part 6 and Title 20

We offer FREE

Ace Tools™

Easy-to-use Energy Code Ace tools help you identify the forms, installation techniques, and standards relevant to building projects in California

Ace Training™

Targeted classroom and online trainings on Title 24, Part 6 and Title 20 address various stakeholders and measures

Ace Resources™

Resources such as Fact Sheets, Trigger Sheets and Checklists, help you understand how and when to comply with California's building and appliance energy efficiency standards

www.EnergyCodeAce.com

This program is funded by California utility customers under the auspices of the California Public Utilities Commission and in support of the California Energy Commission.

SSNiF Worksheet (for CASE Author Reference Only)

Stakeholder	Situation	Need	Feature/ solution
What market actors are involved in implementing this measure?	- What level of subject matter expertise do they have? - What level of technology expertise? - What is their workflow/ tasks? - Where do they perform their work?	- What is their work product in relation to this measure? - Do they need to coordinate with other market actors? - What does success look like to the user?	- What solution could meet the specific need identified?
Lighting Designers	- They design the lighting and ensure it conforms to T24 requirements. - They are experts in lighting technology, both luminaires and controls. They are knowledgeable about energy efficiency. - Work Tasks: They design both indoor and outdoor lighting and ensure it complies with the code. They fill out Compliance Forms and ensure everything is working properly. They work with other team members to ensure the system performs to owner specifications/needs. - They work from their office but also need to collect data/info from the site.	- Their product is the lighting system and to the complete design compliance forms. - They need to coordinate with manufacturers/dealers to know what products are available. They also coordinate with building owner to determine what their needs/wants are. - The outdoor lighting system is successful if it's designed to the building owner's specific needs (technologically, economically, etc.) and it falls within compliance.	
Contractor/ builder	- They don't necessarily understand the code or need to – just follow the lighting design. - They probably have a high level of technology expertise since they install/work with it. - They receive lighting designs and build the system. - Their work is performed on-site.	- They are responsible for following what's in the design – if they don't, the system can end up not being in compliance. They complete installation compliance forms. - They buy from retailers/ distributors and need to coordinate with the lighting designer/electrician. They also coordinate with the commissioning agent and ATT. They need to coordinate to ensure the design is followed and stays in compliance. They also need to buy the appropriate products. - Contractors want to quickly finish the job, pass Cx or AT, pass inspection. They want a design that is clear and easy to understand so they can complete the work in the least amount of site visits.	

SSNiF Worksheet (for CASE Author Reference Only)

Stakeholder	Situation	Need	Feature/ solution
Electrician	- They must understand the code at least on a basic level as they might be responsible for designing the lighting system. They might also play a similar role to contractor/builder and just follow lighting design. - They likely have a high level of technology expertise since they install/work with it. - They might design the lighting systems/build it or they might just receive lighting designs and build the system. - Their work is performed on-site or in their office.	- If designing the system, they are responsible for ensuring it follows the code. They would also be responsible for filling out design compliance forms. If they are only building the system, they are responsible for following what's in the design – if they don't, the system can end up not being in compliance. They would complete installation compliance forms. - If designing the system they will need to work with building owners and manufacturers to know what's on the market. If building the system, they buy from manufacturers and need to coordinate with the lighting designer/electrician/whoever designed the system. They need to coordinate to ensure the design is followed and stays in compliance. They also need to buy the appropriate products. - It's a success if they design the system to the owner's specs and it's within compliance. If just building the system, it's a success if the system is built to the design and works properly.	
Energy Consultant / modeler	- They are experts on Title 24, Part 6 and compliance/compliance forms/compliance steps. - They often need to explain code requirements to their clients who do not have the same level of energy code expertise. - They are likely experts on technology since they can help designers ensure compliance. - They are hired by designers/building owners to help interpret the code/ensure compliance/fill out paperwork. - They may run a compliance model if lighting is included in the performance path. - In their office, potentially on-site.	- They generate compliance documentation as well as provide assistance in code interpretation. - They coordinate with designers, installers, building owners, and compliance agencies. - Success is if the compliance documents are properly filled out, sent to the appropriate parties, and are within compliance. - Success also includes meeting project deadlines, and budgets. Avoiding re-design related to code requirements. Also having minimal energy code related plan check comments.	- .

Compliance and Enforcement

- Compliance is important and playing a bigger role in these discussions
- Need to make sure code changes are “implementable” and “enforceable”
- Want to hear from you so we understand:
  - Who is involved in implementing this measure?
  - What does each market actor do to comply?
  - What does success look like to each market actor?
  - What resources are necessary?

Compliance and Enforcement—Market Actors

- Who would be involved in implementing this measure?
  - Market Actor #1
  - Market Actor #2
  - Market Actor #3
- Others?

Compliance and Enforcement—Tasks

Market Actor	Task(s)	Success Criteria
HVAC, Electrical and Lighting Designers	- Design system to meet Title 24 code - System performs to owner specifications & needs. - Compliance forms	- System meets owner needs - Do this quickly and within budget and schedule - Do this cost-effectively - System is Title 24 compliant
Contractor/Builder	- Build system exactly as designed to meet code - Purchase system from retailers/distributors - Coordinate with other market actors - Work on-site - System performs to owner specifications & needs. - Compliance forms depending on project size and on the contracting methods used.	- Do this quickly and within budget and schedule - Do this with minimal paperwork - System is Title 24 compliant

Compliance and Enforcement—Resources

Market Actor	Resource(s)
Lighting Designers	- Compliance Software, such as CBECC-COM, CBECC-RES, Right-Energy Title 24, and soon IES-VE. - EnergyCodeAce tools
Contractor/Builder	- Compliance manuals - CEC Hotline - EnergyCodeAce tools - Online permitting system
Electrician	- EnergyCodeAce tools
Energy Consultant/Modeler	- Compliance Software, such as CBECC-COM, CBECC-RES, Right-Energy Title 24, and soon IES-VE. - Compliance manuals - EnergyCodeAce tools

- **What resources or tools are typically used for compliance?**

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Thank you.

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