<table>
<thead>
<tr>
<th><strong>Docket Number:</strong></th>
<th>17-BSTD-01</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Title:</strong></td>
<td>2019 Building Energy Efficiency Standards PreRulemaking</td>
</tr>
<tr>
<td><strong>TN #:</strong></td>
<td>217285</td>
</tr>
<tr>
<td><strong>Document Title:</strong></td>
<td>4-20-2017 Staff Workshop Introduction - 2019 Pre-Rulemaking for Building Energy Efficiency Standards</td>
</tr>
<tr>
<td><strong>Description:</strong></td>
<td>Introductory Presentation by Payam Bozorgchami.</td>
</tr>
<tr>
<td><strong>Filer:</strong></td>
<td>Adrian Ownby</td>
</tr>
<tr>
<td><strong>Organization:</strong></td>
<td>California Energy Commission</td>
</tr>
<tr>
<td><strong>Submitter Role:</strong></td>
<td>Commission Staff</td>
</tr>
<tr>
<td><strong>Submission Date:</strong></td>
<td>4/24/2017 4:21:08 PM</td>
</tr>
<tr>
<td><strong>Docketed Date:</strong></td>
<td>4/24/2017</td>
</tr>
</tbody>
</table>
2019 Pre-Rulemaking for Building Energy Efficiency Standards

Payam Bozorgchami, PE
Project Manager, 2019 Building Energy Efficiency Standards

April 20, 2017
Housekeeping Items

- In Case of an Emergency
- Restrooms
- Snacks
What We Will Cover Today

• Some Basics, Background
• How Title 24, Part 6 is Developed
• Mazi Shirakh
  o Introduce the Energy Design Rating (EDR) for the Residential Buildings.
    ✓ For Efficiency-only
    ✓ Efficiency and PV
• Christopher Meyer
  o Proposed Model PV Ordinance for local Jurisdictions.
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.
California Energy Commission Responsibilities

**Forecasting**: Forecasts future energy needs and maintains historical energy data

**Permitting**: Permits thermal power plants 50 MW or larger

**R&D**: Administers research and development programs, advancing science and technology in energy related fields

**Energy Efficiency**: Promotes energy efficiency by setting the state's appliance and building standards (Title 20 & 24)

**Renewable Energy**: Supports the development of renewables through certification of facilities and verification of generation

**Contingency Planning**: Plans for and directs the State’s response to energy emergencies

**Transportation**: Supports deployment of alternative and renewable fuel sources

**IEPR**: Publishes the Integrated Energy Policy Report – the State’s energy policy document
Policy Drivers For Building Standards

- Governor's “Clean Energy Jobs Plan”
- Governor Brown’s ZNE goals – focused on ZNE building code requirement by 2020 for newly constructed residential buildings – get there in three code cycles (2013, 2016, 2019)
- Zero Net Energy: Residential by 2020 and Nonresidential by 2030
- CARB Climate Change Scoping Plan
- California Long Term Energy Efficiency Strategic Plan
California Energy Efficiency Policy

• Avoid new power plants & transmission while maintaining reliability, affordability & safety
• Meet resource needs at lowest cost & least environmental impact
• Loading order
  1) Energy efficiency & Demand Response
  2) Renewable generation & Storage
  3) Cleanest conventional sources
How Standards Are Updated

• Energy Commission Staff with help from the Utility partners and the consultants write the Triennial Standards update.

• The updates are presented at both Utility-Sponsored Stakeholder meetings and the public in staff workshops and committee hearings.
California Standards for California Climates

- Focus on CA Climate Diversity
  - Standards set expectations for climate-specific designs
  - CA weather data captures statewide coincident peak demand climate conditions

Coastal - 1, 3, 5, 6, 7, 8
Inland - 2, 4, 9, 10
Central Valley - 11, 12, 13
Desert - 14, 15
Mountains - 16
Life Cycle Costing

Standards measures must be cost effective

1. Using Life Cycle Costing Methodology (LCC)
   i. Discounted cash flows for costs and benefits
   ii. Accounts for maintenance costs/benefits
   iii. Appropriate discount rates and life of measures -
        30 years for residential measures
        15 years for nonresidential measures

2. Time Dependent Valuation (TDV)
   i. Value of gas and electricity changes depending on the season and the time of day
   ii. 8,760 TDV multipliers for each hour of the year
   iii. Favors measures that save energy during high demand periods
Zero Net Energy Standards

- Achieve additional energy savings from building components regulated under Title-24 to reach ZNE goals
- Integrate onsite generation into building Standards to accomplish ZNE

Impacts of Building Standards on Home Energy Use
2019 Standards Process

We are very early in the process, the pre-rulemaking is set to begin soon

<table>
<thead>
<tr>
<th>DATE</th>
<th>MILESTONES</th>
</tr>
</thead>
<tbody>
<tr>
<td>February 2016-July 2016</td>
<td>Measures Identified and approval</td>
</tr>
<tr>
<td>August 2016 to June 2017</td>
<td>Stakeholder meeting/workshop &amp; final staff workshop</td>
</tr>
<tr>
<td>April, 2017</td>
<td>CASE Reports submitted to the CEC</td>
</tr>
<tr>
<td>December 1, 2017</td>
<td>45-day Language Hearings</td>
</tr>
<tr>
<td>March 1, 2018</td>
<td>Adoption of 2019 Standards at Business Meeting</td>
</tr>
<tr>
<td>June 1, 2018 to November</td>
<td>Staff work on Software, Compliance Manuals, Electronic Documents Available to Industry</td>
</tr>
<tr>
<td>November 2018</td>
<td>Approval of the Manuals</td>
</tr>
<tr>
<td>November 1, 2018</td>
<td></td>
</tr>
<tr>
<td>January 1, 2019</td>
<td>Software, Compliance Manuals, Electronic Documents Available to Industry</td>
</tr>
<tr>
<td>January 1, 2020</td>
<td>Effective Date</td>
</tr>
</tbody>
</table>
## Pre-Rulemaking Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 20, 2017</td>
<td>PV and ZNE (Treat it like a CASE workshop)</td>
</tr>
<tr>
<td>May 23, 2017</td>
<td>PV and ZNE continuation showing the final EDR values for Efficiency and one for PV + Efficiency</td>
</tr>
</tbody>
</table>
| June 1, 2017 | • Residential Envelope Measures  
  o Residential High Performance Walls  
  o Residential High Performance Attics  
  o Residential High Performance Windows and Doors  
  o Residential Quality Insulation Installation (QII))  
  • Residential Water Heating Measures  
  o Residential Compact Hot Water Distribution Design  
  o Residential Drain Water Heater Recovery) |
| June 6, 2017 | • Indoor Air Quality Measures  
  o Residential Indoor Air Quality  
  o Nonresidential Indoor Air Quality  
  • Laboratory Measures  
  o Induction Exhaust Fans  
  o High Efficiency Fume Hoods  
  • Warehouse Topics  
  o Hybrid Condensers  
  o Loading Dock Seals  
  • Residential HVAC Measure  
  o Residential Quality HVAC |
# Pre-Rulemaking Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topics</th>
</tr>
</thead>
</table>
| June 20, 2017   | • Nonresidential HVAC  
|                 |   - Water Side Economizer  
|                 |   - Fan System Power  
|                 |   - Exhaust Air Energy Recovery  
|                 |   - Equipment Efficiency  
|                 |   - Transfer Air for Exhaust Air Makeup  
|                 |   - Demand Control Ventilation for Classrooms  
|                 |   - Occupant Sensor Ventilation  
|                 |   - Cooling Tower Minimum Efficiency  
|                 |   - Fault Detection Diagnostics (FDD) for Built-up Systems)                                                                          |
| June 22, 2017   | • Nonresidential Lighting Measures  
|                 |   - Indoor Lighting Sources  
|                 |   - Indoor Lighting Controls  
|                 |   - Lighting Alterations  
|                 |   - Advanced Daylighting Design  
|                 |   - Outdoor Lighting Source  
|                 |   - Outdoor Lighting Controls |
| June 29, 2017   | Hospital Measures; Demand Response (Clean Up); ATTCP Requirements                                                                       |
| July 13, 2017   | TBD                                                                                                                                     |
2019 Standards Process

1. Update the TDV values to reflect the current NG and Electricity costs

2. Update the Life Cycle Costing (LCC) assumption based on TDV and other parameters

3. Using the updated TDVs, evaluate cost effectiveness of additional envelope measures for the extreme cooling climate zones; possible measures include additional roof deck insulation for high performance attics and improving the wall U-factors

4. Using the updated TDVs, determine the cost effectiveness and size of PV systems for each climate zone.
2019 Title 24 Utility-Sponsored Stakeholder
http://title24stakeholders.com/

Building Energy Efficiency Program
http://www.energy.ca.gov/title24/

Comments to be submitted to
Standards Contact Information – Energy Commission

Mazi Shirakh, PE
ZNE Technical Lead & Advisor to the 2019 Building Standard Staff.
Mazi.Shirakh@energy.ca.gov
916-654-3839

Payam Bozorgchami, PE
Project Manager, 2019 Building Standards
Payam.Bozorgchami@energy.ca.gov
916-654-4618

Larry Froess, PE
CBECC Software Lead
Larry.Froess@energy.ca.gov
916-654-4525

Peter Strait
Supervisor, Building Standards Development
Peter.Strait@energy.ca.gov
916-654-2817

Christopher Meyer
Manager, Building Standards Office
Christopher.Meyer@energy.ca.gov
916-654-4052

Todd Ferris
Supervisor, Software Tools Development
Todd.Ferris@energy.ca.gov
916-654-4072
Questions?