California Reach Standards for Building Energy Efficiency

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High Performance Buildings and Standards Development Office
California Energy Commission

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Presentation Topics

• CEC approval of Local Energy Ordinances
• 2013 Building Energy Efficiency Standards Update
• 2013 Voluntary Reach Standards Update
Two Different State Commissions

• All local energy efficiency standards that meet or exceed the California Building Energy Efficiency Standards (Title 24, Part 6) must be approved by the California Energy Commission.

• All local standards that exceed the California Building Code (plumbing, electric, historic, etc) must be filed with the California Building Standards Commission.
The Application to the Commission

• Required Documentation
  o A copy of the ordinance.
  o A study or analysis showing the expected energy savings and the cost effectiveness of the ordinance.
  o A statement/finding that the ordinance will require buildings to “consume no more energy than is permitted by (Title 24) Part 6.”
  o The date the ordinance, energy savings and cost-effectiveness study were presented to Council/Board in a Publicly Noticed Meeting.
  o A letter to the Executive Director assuring them that the City/County will continue to enforce Title 24, Part 6 as well as the proposed Ordinance.
  o Evidence of CEQA compliance.
Your Ordinance Needs Approval if it has any of the Following Elements

- Green Building Standard that includes mandatory energy efficiency requirements that meet or exceed the statewide Standard.

- Using Non-Governmental Certification Programs that meet or exceed the statewide Standard.

- Adopting CalGreen Tier I or II.

- Early Adoption of Energy Standards

- Adoption of stricter energy budgets

- Renewal or Updating Existing Ordinance
Evidence of CEQA Compliance

Local agencies must include any findings, determinations, declarations or reports, including any determination of exemption, negative declaration or environmental impact report, that are required by CEQA.

The Commission is required to review and consider any Exemption, EIR or Negative Declaration prepared by the local agency, as well as comments made to the local agency.
Commission Review of a Complete Application

Ordinance Review

Ensure that buildings will consume no more energy than permitted by Title 24, Part 6.

- Clear requirements to ensure greater energy efficiency.
- Clear statement(s) that Title 24, Part 6 will still be enforced.
- Exceptions or exemptions are explicitly limited to the ordinance and do not affect compliance with Title 24, Part 6.
- Look for elements that may trigger a Federal Preemption.

We will gladly review your draft ordinance.

California Energy Commission
www.energy.ca.gov
Resources

California Energy Commission, Approved Local Ordinances
http://www.energy.ca.gov/title24/2008standards/ordinances/
Joe Loyer, JMLoyer@energy.state.ca.us (916) 654-4811

Utility Contacts for Cost Effectiveness Studies

<table>
<thead>
<tr>
<th>Southern California Edison</th>
<th>San Diego Gas and Electric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Javier Mariscal</td>
<td>Ron Gorman</td>
</tr>
<tr>
<td><a href="mailto:Javier.mariscal@sce.com">Javier.mariscal@sce.com</a></td>
<td><a href="mailto:RAGorman@sempreutilities.com">RAGorman@sempreutilities.com</a></td>
</tr>
<tr>
<td>(626)633-7154</td>
<td>(213) 244-5366</td>
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<table>
<thead>
<tr>
<th>Pacific Gas and Electric</th>
<th>Please CC</th>
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<tbody>
<tr>
<td>Pat Eilert</td>
<td>Misti Bruceri</td>
</tr>
<tr>
<td><a href="mailto:Ple2@pge.com">Ple2@pge.com</a></td>
<td><a href="mailto:mistib@comcast.net">mistib@comcast.net</a></td>
</tr>
<tr>
<td>(530) 757-5261</td>
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</tr>
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</table>

California Building Standards Commission
http://www.bsc.ca.gov/default.htm
• First year savings: 464 GWh, 11M therms
  o Most of savings (90%) coming from nonresidential sector: buildings & processes
  o Savings dampened by economic downturn
  o After 30 years, savings accrue to the equivalent of 6 power plants; 1.7 million homes; 140 million iPads
2013 Standards Update

• Residential Highlights
  o Better windows U-factor and SHGC
  o More wall insulation in all climate zones
  o Mandatory HVAC and air distribution system installation testing
  o Ventilative cooling (e.g. whole house fans), where appropriate
  o Improved hot water system performance, saving both energy and water
  o “Solar ready” roofs - provides an area on roof that is penetration and shade free
  o Simplified rules for additions and alterations
2013 Standards Update

• Nonresidential Highlights
  o Multi-level lighting control requirements
  o Lower threshold for when lighting alterations need to meet code requirements
  o Daylighting – better controls; windows with good visual transmittance; more skylights
  o Higher cool roof reflectance & building envelope sealing
  o “Solar ready” roofs
  o HVAC economizers & speed controls on more and smaller equipment
  o Cooling Tower Water Efficiency
  o New efficiency requirements for process energy systems:
    ▪ Commercial Refrigeration
    ▪ Commercial Kitchen & Laboratory Exhaust Systems
    ▪ Process Boilers
    ▪ Data Center Cooling
    ▪ Compressed Air Systems
    ▪ Parking Garage Ventilation
2013 Title 24, Part 11, Appendices A5
All Nonresidential Buildings

Prerequisites
- High Efficacy Outdoor Lighting
- Service Water Heating in Large Restaurants – 15% Solar Fraction or 95% water heater efficiency

Tier I
- 95% of Energy Budget – lighting OR mechanical
- 90% of Energy Budget – lighting AND mechanical

Tier II
- 90% of Energy Budget – lighting OR mechanical
- 85% of Energy Budget – lighting AND mechanical

If the permit is only for the building envelope, then just the prerequisites must be met.
2013 Title 24, Part 11, Appendix A4
Newly Constructed Residential

Prerequisites
- Whole Building Design Rating
- Quality Insulation Inspection
- High Efficacy Indoor Lighting
- High Efficacy Outdoor Lighting

Tier I
- 85% of Energy Budget
- Limit of no more than 10,000 kWh per year

Tier II
- 70% of Energy Budget
- Limit of no more than 8,500 kWh per year

A proposed design exceeding the kWh/yr limit must use additional energy efficiency measures or on-site solar electric system to comply with the limit.

California Energy Commission
www.energy.ca.gov
2013 Title 24, Part 11, Appendix A4
Newly Constructed Residential

Zero Net Energy
ELECTIVE Performance Approach

• Meet all Tier II requirements
• Zero or less on the Whole House Design Rating
2013 Title 24, Part 11, Appendix A4
Additions and Alterations to Existing Residential Buildings

Prerequisites
• Quality Insulation Inspection
• High Efficacy Indoor Lighting
• High Efficacy Outdoor Lighting

Tier I
• 95% of Energy Budget – one mechanical system
• 90% of Energy Budget – two or more mechanical systems

Tier II
• 90% of Energy Budget – one mechanical system
• 85% of Energy Budget – two or more mechanical systems

If the addition or alteration changes the envelope with no change to the mechanical systems, then no additional efficiency measures above Title 24, Part 6 are required.
Ongoing Challenges...

• Changing building practices
• Improving code compliance
• Increases in plug load energy use
### Electricity End Uses

<table>
<thead>
<tr>
<th>End-Use</th>
<th>kWh/yr</th>
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<tbody>
<tr>
<td>Not covered by T-24</td>
<td>3,612</td>
</tr>
<tr>
<td>Dryer</td>
<td>187</td>
</tr>
<tr>
<td>Clothes Washer</td>
<td>109</td>
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<tr>
<td>Dish Washer</td>
<td>73</td>
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<tr>
<td>First Refrigerator</td>
<td>707</td>
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<tr>
<td>Additional Refrigerator</td>
<td>313</td>
</tr>
<tr>
<td>Freezer</td>
<td>138</td>
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<tr>
<td>Range/Oven</td>
<td>105</td>
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<tr>
<td>Television</td>
<td>645</td>
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<tr>
<td>Microwave</td>
<td>122</td>
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<tr>
<td>Home Office Equipment</td>
<td>17</td>
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<tr>
<td>Personal Computer</td>
<td>602</td>
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<tr>
<td>Well Pump</td>
<td>28</td>
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<tr>
<td>Miscellaneous</td>
<td>568</td>
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<tr>
<td><strong>T-24 + Preempted</strong></td>
<td>1,106</td>
</tr>
<tr>
<td>Conv. Space Heating</td>
<td>37</td>
</tr>
<tr>
<td>Heating</td>
<td>13</td>
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<tr>
<td>Aux. Space Heating</td>
<td>0</td>
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<tr>
<td>Central Air Conditioning</td>
<td>876</td>
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<td>Room Air Conditioning</td>
<td>47</td>
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<td>Water Heating</td>
<td>133</td>
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<tr>
<td><strong>T-24</strong></td>
<td>1,927</td>
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<tr>
<td>Furnace Fan</td>
<td>164</td>
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<td>Attic Fan</td>
<td>14</td>
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<td>Evaporative Cooling</td>
<td>43</td>
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<tr>
<td>Solar Water Heating</td>
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<tr>
<td>Pool Pump</td>
<td>234</td>
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<tr>
<td>Spa</td>
<td>25</td>
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<tr>
<td>Outdoor Lighting</td>
<td>284</td>
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<tr>
<td>Spa Electric Heat</td>
<td>28</td>
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<tr>
<td>Lighting</td>
<td>1,136</td>
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<td><strong>Total</strong></td>
<td>6,645</td>
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#### Natural Gas End Uses

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<thead>
<tr>
<th>End-Use</th>
<th>Therm/yr</th>
<th>%</th>
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<tbody>
<tr>
<td>Not Covered by T-24</td>
<td>51.4</td>
<td>14%</td>
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<tr>
<td>Dryer</td>
<td>16.2</td>
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<tr>
<td>Range/Oven</td>
<td>31.7</td>
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<tr>
<td>Miscellaneous</td>
<td>3.5</td>
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<tr>
<td><strong>T-24 + preempted</strong></td>
<td>309.0</td>
<td>83%</td>
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<tr>
<td>Primary Heat</td>
<td>175.8</td>
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<td>Conv. Gas Water Heat</td>
<td>133.2</td>
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<tr>
<td><strong>T-24</strong></td>
<td>10.2</td>
<td>3%</td>
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<tr>
<td>Pool Heat</td>
<td>5.6</td>
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<tr>
<td>Spa Heat</td>
<td>2.9</td>
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<tr>
<td>Auxiliary Heat</td>
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<tr>
<td><strong>Total</strong></td>
<td>370.5</td>
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- Not covered by Title-24
- Energy use partly influenced by Title-24
- Covered by Title-24

Weighted consumption from 2009 Residential Appliance Saturation Survey
The End

Reach Standards Development: mbrook@energy.ca.gov
Local Government Support for Reach Standards Adoption: jmloyer@energy.ca.gov