Draft—2016 Title 24 Residential Lighting

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Current Title 24, Part 6 Residential Lighting Code

Three Main Technologies:

1. High-efficacy luminaires (CFL and LED)
2. Sensors: occupancy/vacancy, motion and daylight
3. Dimmers

2013 Title 24, Part 6 Standards by Area

Kitchen	• > 50% of installed wattage must be high efficacy
Bathroom	• One high efficacy fixture **and** • Manual-on vacancy sensor **or** high efficacy for all other fixtures
Garage, laundry room, utility room, closets	• High efficacy **and** • Manual-on vacancy sensor
All other interior rooms	• High efficacy **or** • Manual-on vacancy sensor **or** • Dimmer

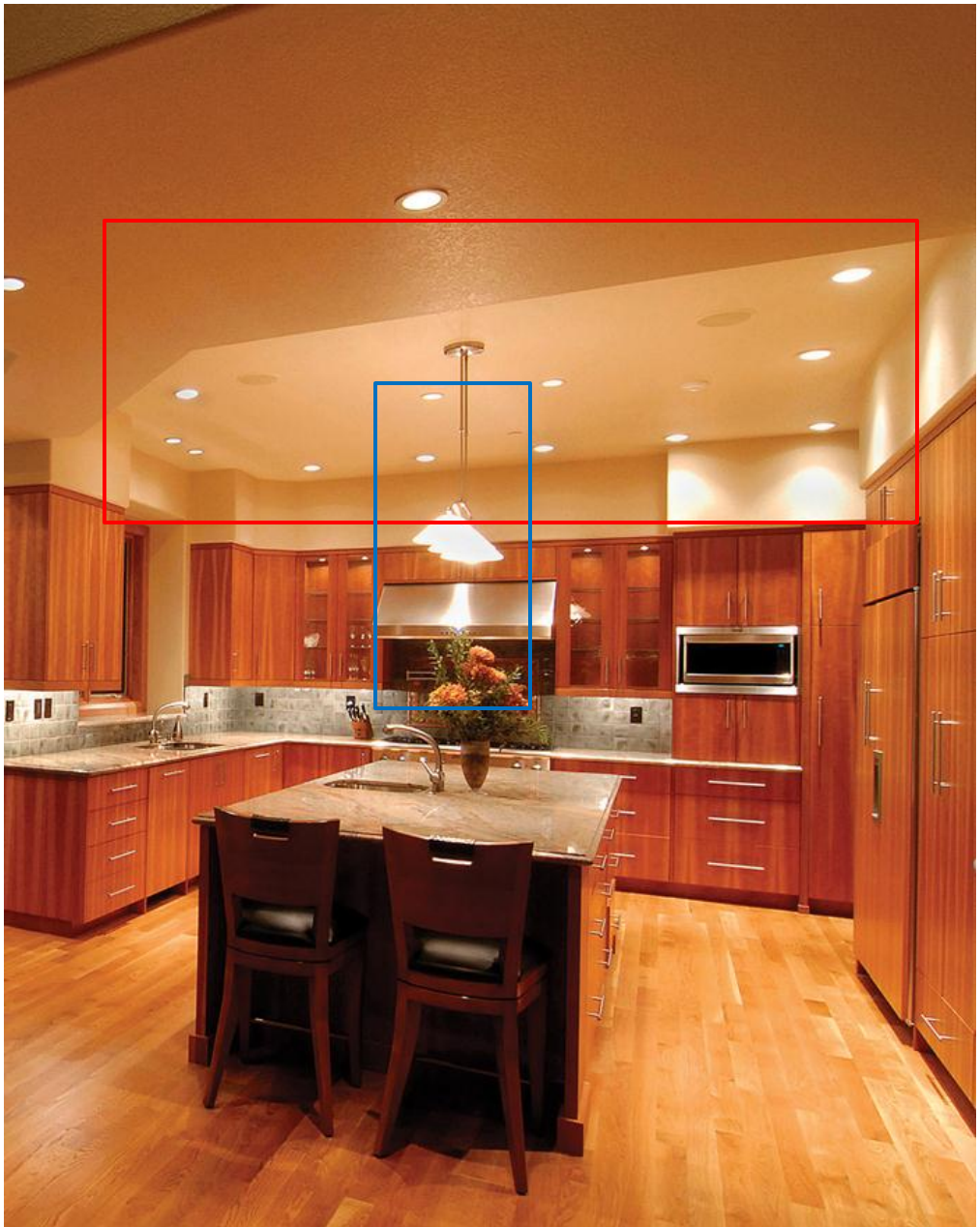
Outdoor lighting	• High efficacy **or**
	• Low efficacy controlled by a manual on/off switch **and both:**
	  • Motion sensor without bypass switch **and**
	  • One of the following: integral photocontrol, astronomical time clock, energy management control system

Common areas	• High efficacy or vacancy sensor in areas where common space ≤ 20% of floor area • In common areas that > 20% of floor area, occupancy responsive adaptive corridor and stairwell lighting is required
Residential parking	• Lots for < 7 cars must comply with Outdoor Lighting requirements • Garages for < 7 cars must comply with Garage requirements • Lots and garages for 8 vehicles or more must comply with Nonresidential Lighting Standards

Appendix JA8

- Joint Appendix JA8 of the 2013 code sets new quality standards for LED luminaires designed for residential use.
- Indoor high efficacy: CRI ≥ 90, CCT of 2700K – 4000K
- Outdoor high efficacy: exempted from CRI requirement, CCT of 2700K – 5000K

Kitchen 50% High Efficacy



Bathroom

2008: High efficacy **or**
manual-on vacancy sensor

2013: One high-efficacy fixture **and** manual-on vacancy sensor **or** high efficacy for all other fixtures

Laundry

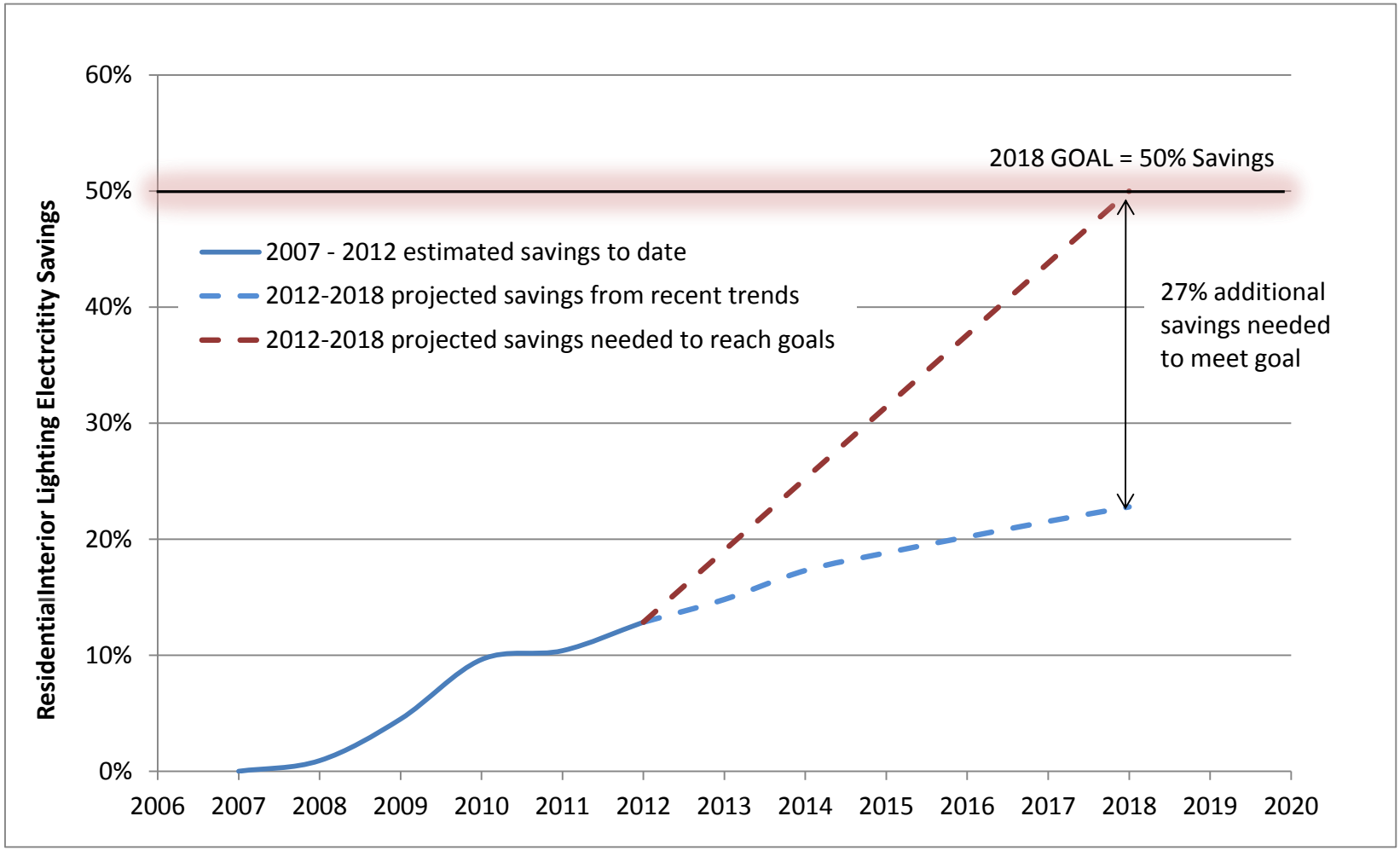
- High efficacy

  or

- Manual-on vacancy sensor

- High efficacy **and** manual-on vacancy sensor

Electricity Savings Estimates Residential Interior Lighting



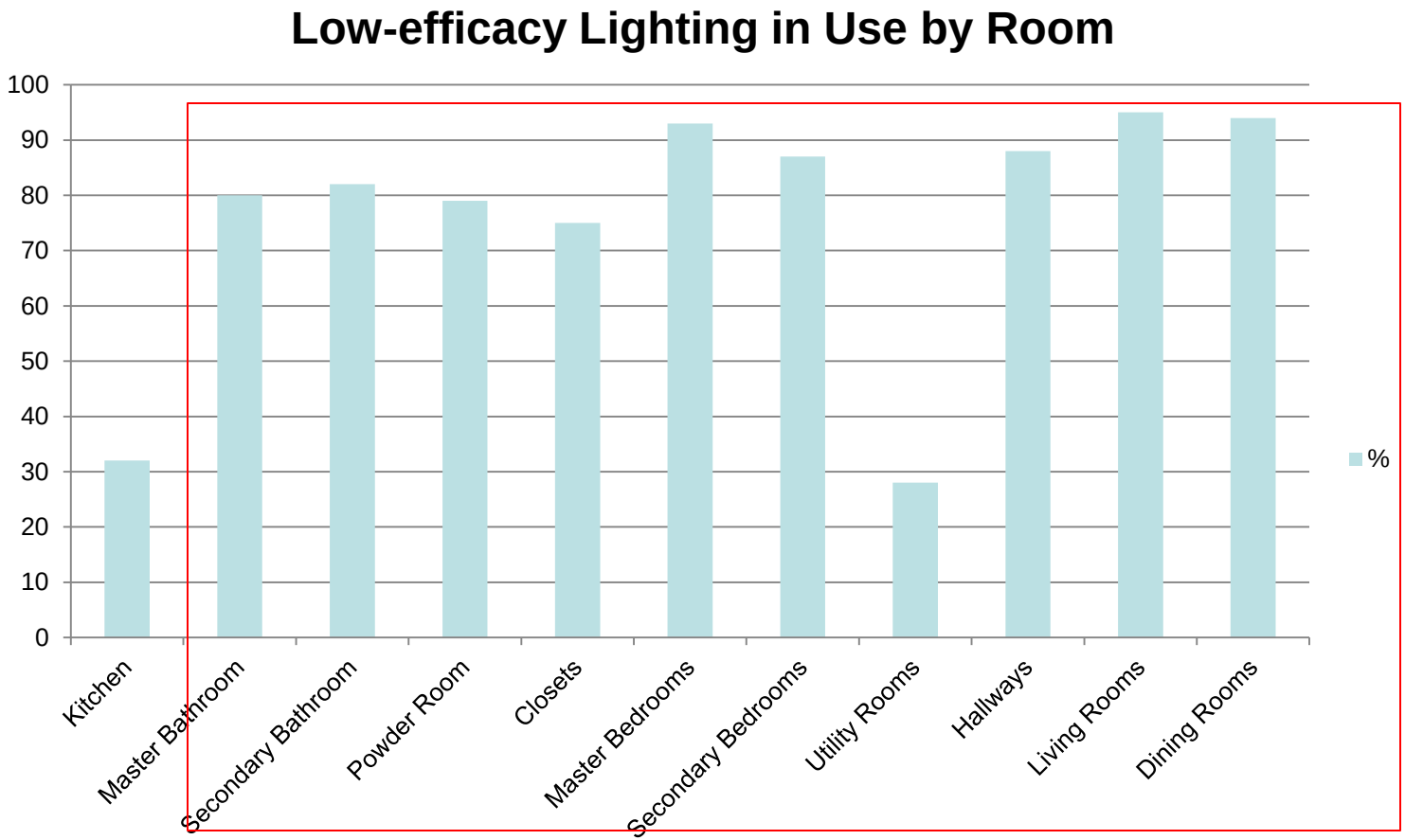
Source: CLTC calculations

~75% energy used for lighting is from low-efficacy fixtures (~45% savings potential)

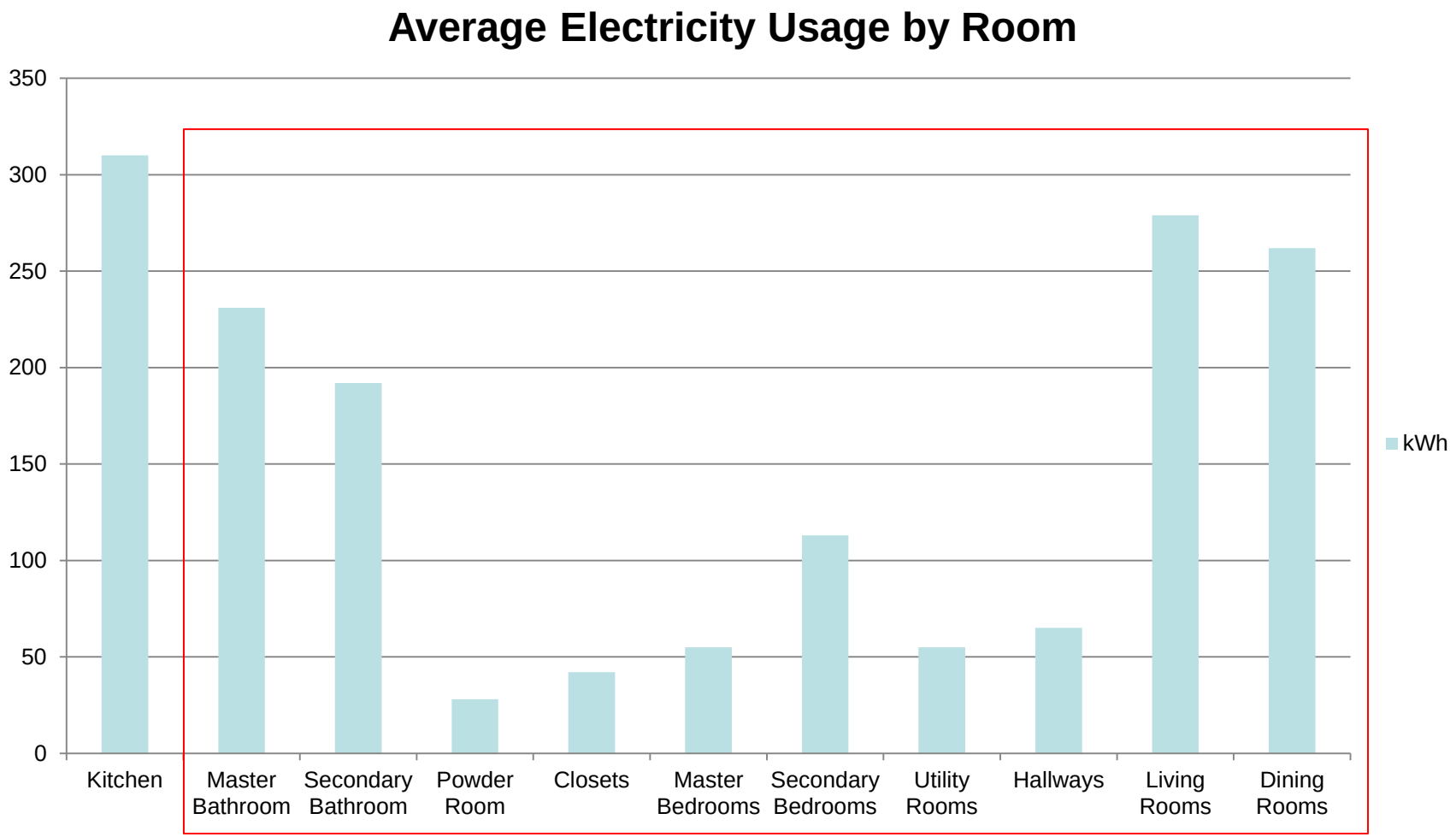
CA Residential Lighting Efficacy

75% of annual kWh usage per residence is low efficacy

45% energy savings can be obtained by switching to high efficacy



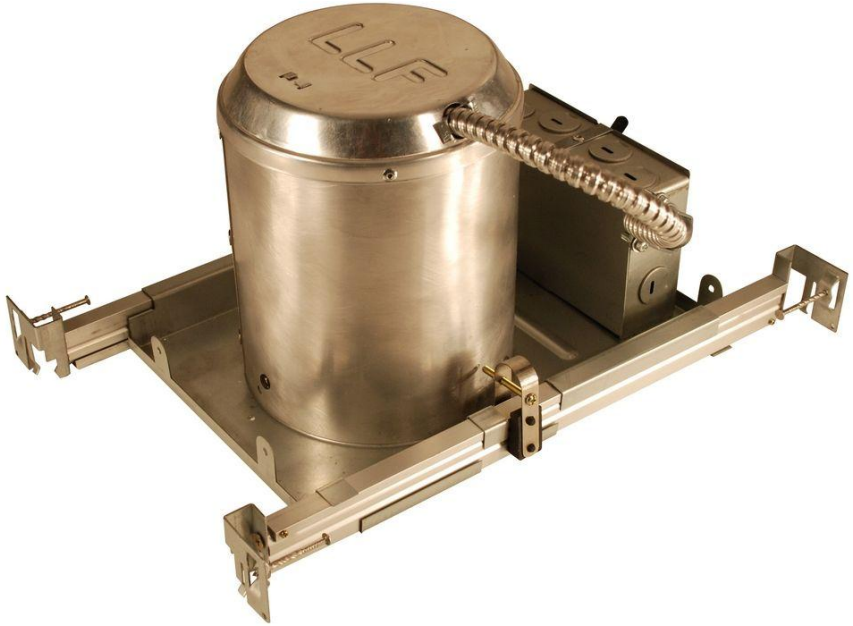
CA Residential Electricity Use



2016 Working Proposal

1. All high-efficacy lighting
2. All recessed downlights must be high efficacy
3. Recognizing all luminaires—other than recessed—with medium-base sockets as high efficacy if at the time of inspection the sockets are populated with California Quality LED sources

Downlights—
High-efficacy trim kits or dedicated LED



Allow high-quality LED lamps for all other fixtures

California Quality LED Lamp Specification

California Quality Lamps

1. Color (CRI)
2. Consistency
3. Dimming
4. Longevity

Voluntary California Quality LED Lamp Specification

- CRI ≥ 90
- R9 > 50
- CCT 2700K or 3000K
- 4-step MacAdam ellipse
- Dimming
- Flicker reduction
- 5-year warranty

Why this proposal makes sense

- Large energy savings
- Tied to SSL
- High quality
- Design choice
- Transparency—Edison base
- ALA support
- Favorable on cost

Alternative proposals

1. High-efficacy dedicated downlights
2. High-efficacy dedicated house-wide

Comparison Proposals

1. Baseline 2013 Title 24, Part 6

2. High-efficacy dedicated downlights <1K

3. High-efficacy Edison approach
   (with dedicated downlights) <1K

4. High-efficacy dedicated house-wide 3–6K

Questions?