Illuminating the Title 24 2013 Residential Lighting Requirements

Agenda

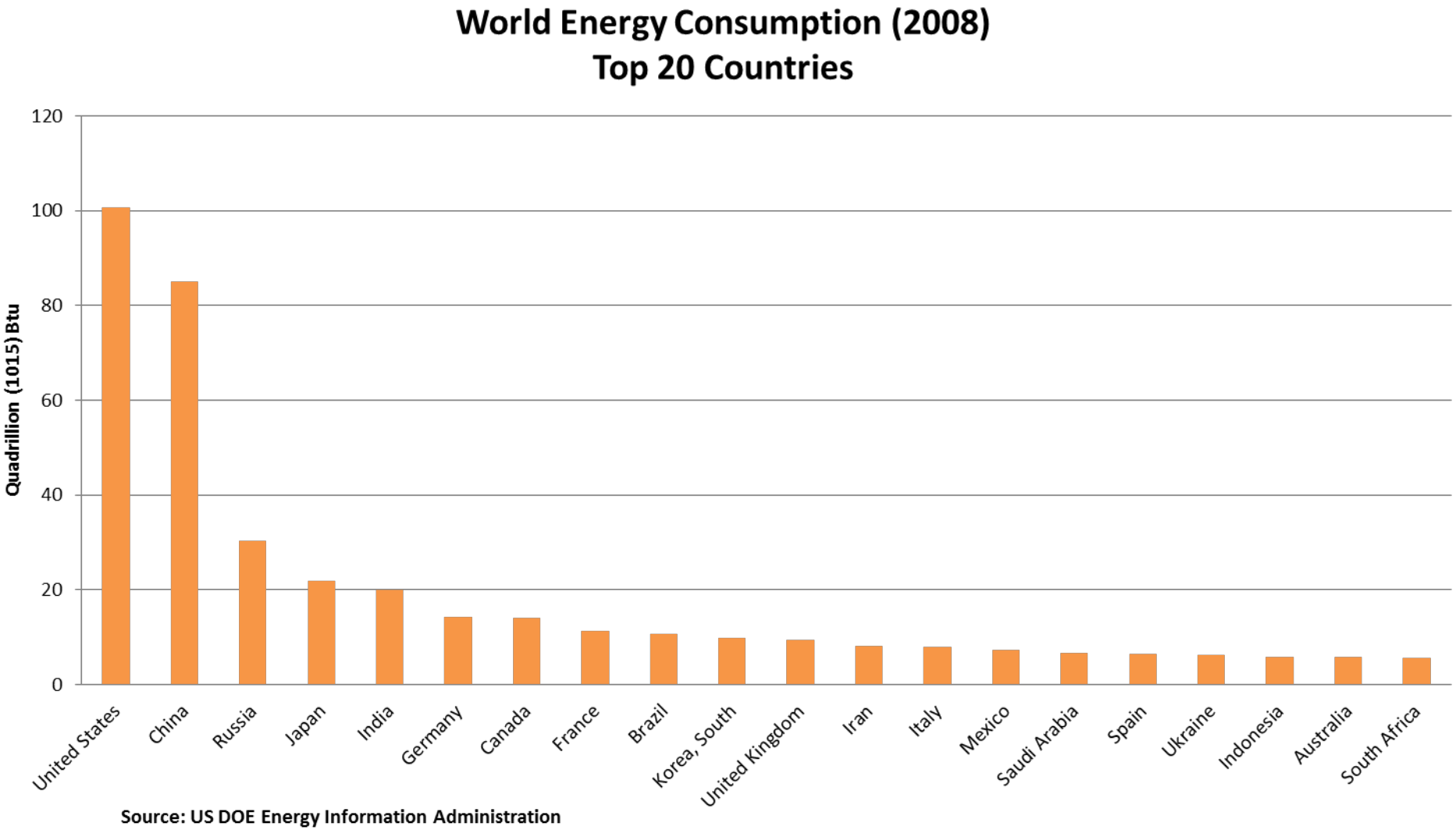
- Big picture energy use
- How lighting controls save energy
- What’s new in Title 24 2013 for residential lighting
- Key mandatory residential lighting requirements in Title 24 2013
- Q&A

Big picture – world energy usage

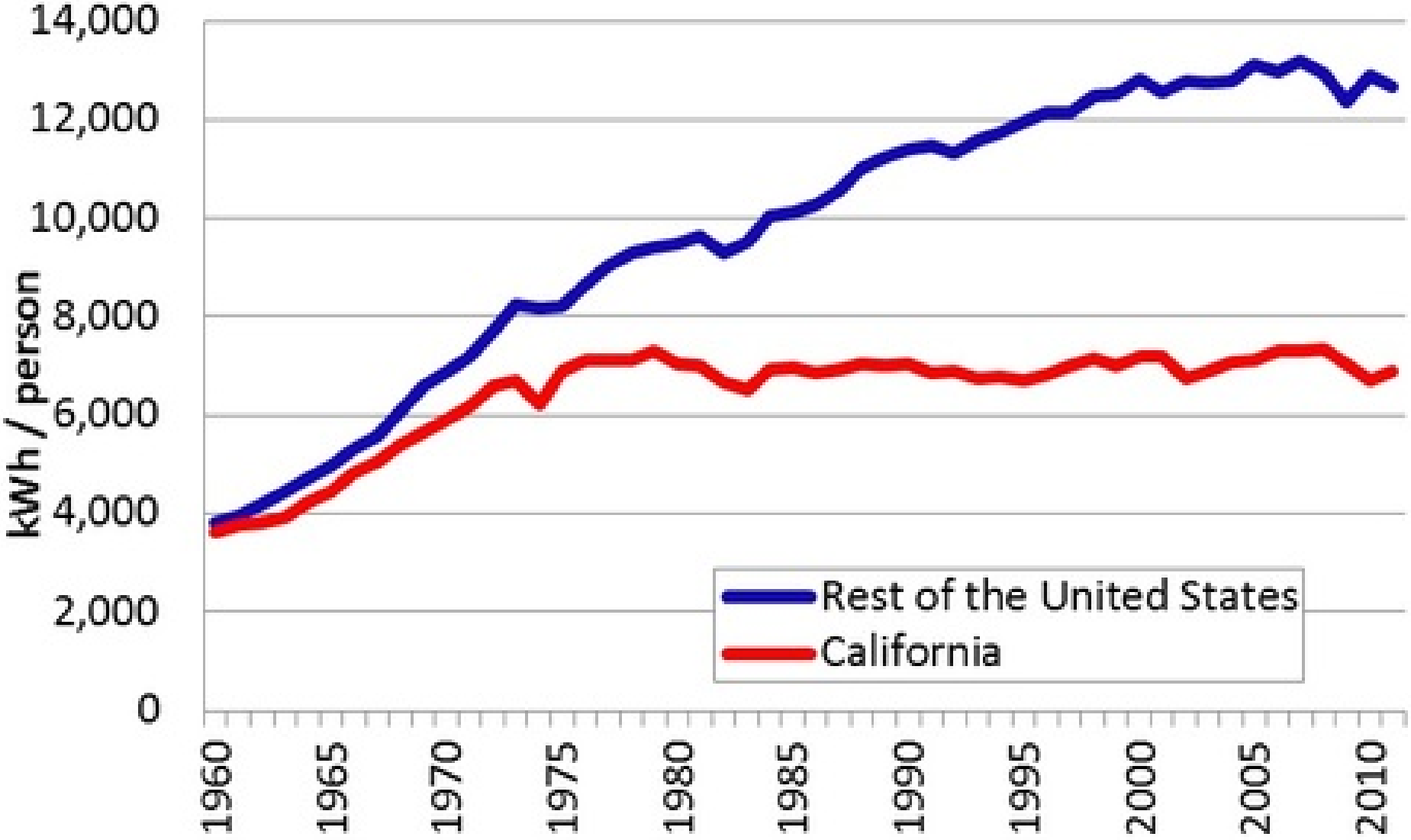
World energy consumption is projected to increase by 44 percent from 2006 to 2030

Sources: U.S. Department of Energy

Big picture – U.S. energy usage

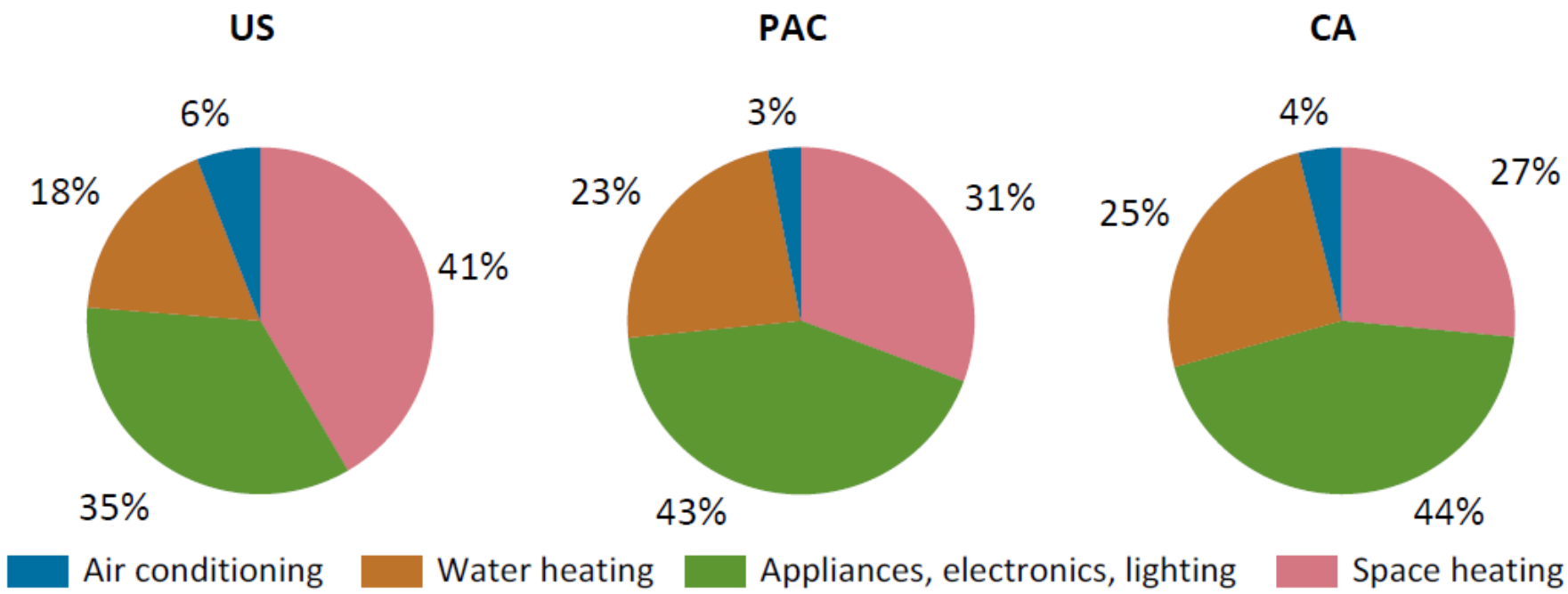


Big picture – U.S. vs. California energy usage



Big picture – Residential energy usage

Consumption by end-use (residential)

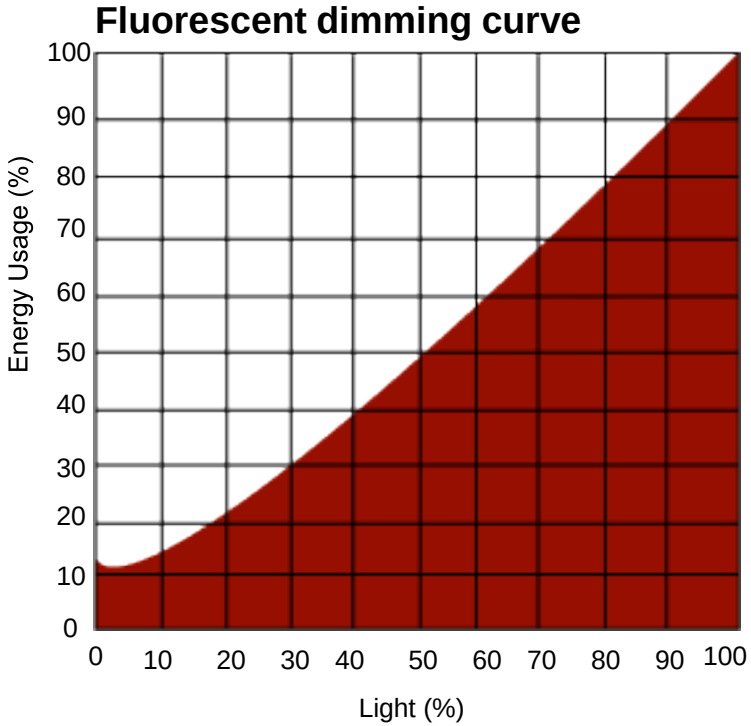


Source: EIA 2009 RECS Survey
http://www.eia.gov/consumption/residential/reports/2009/state_briefs/pdf/ca.pdf

Light control saves energy

Primary ways light control saves energy:

1. Reduces operating hours (switching off)
2. Reduce watts used when lights are on (dimming)
3. Reduces cooling load
4. Maximizes effective use of sunlight



Light control saves energy

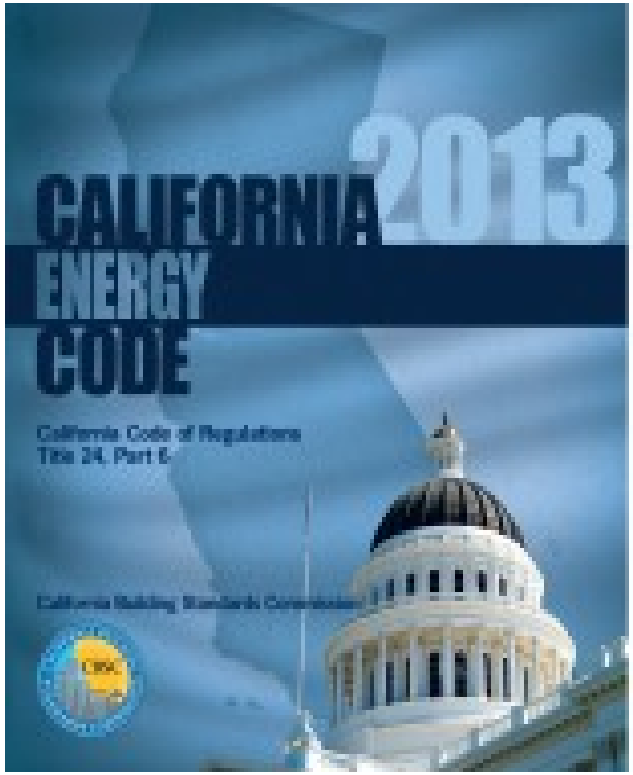
One Year Incandescent/Halogen Energy Savings Chart

dimming the lights	saves electricity	bulbs last on average
10%	10%	3 years
25%	20%	3-6 years
50%	40%	10+ years

Energy codes – Title 24

CA 2013 Building Energy Efficiency Standards

- Title 24, Part 6 is California's energy efficiency code
- Effective July 1, 2014
- Effects all newly constructed or altered commercial and residential buildings
- Interior and exterior lighting requirements
- Many consider Title 24 to be the strictest energy code in the country



What's new?

Key new items for residential lighting:

- Clarification of high efficacy vs. low efficacy ligh
- Night lights (≤ 5 W) don't have controlled with vacancy sensors
- Slight modifications to kitchen lighting
- Bathrooms must have at least 1 high efficacy luminaire.
- Vacancy sensors* are now required in garages, laundry rooms, closets, and utility rooms (along HE lighting).

***Note**: Vacancy sensors cannot be convertible to regular occupancy sensors to comply with residential Title 24 2013 requirements.

High efficacy lighting [Table 150.0A]

Pin-based linear fluorescent or CFLs

Pulse-start metal halide

High pressure sodium lamps

GU-24 sockets for CFLs or LEDs

LED light sources

Induction lamps

High efficacy lighting [Table 150.0B]

TABLE 150.0-B MINIMUM REQUIREMENTS FOR OTHER LIGHT SOURCES TO QUALIFY AS HIGH EFFICACY

Use this table to determine luminaire efficacy only for lighting systems not listed in TABLE 150.0-A	
Luminaire Power Rating	**Minimum Luminaire Efficacy to Qualify as High Efficacy**
5 watts or less	30 lumens per watt
over 5 watts to 15 watts	45 lumens per watt
over 15 watts to 40 watts	60 lumens per watt
over 40 watts	90 lumens per watt
Note: Determine minimum luminaire efficacy using the system initial rated lumens divided by the luminaire total rated system input power.	

Low efficacy lighting [Table 150.0A]

- Sockets capable of using incandescent lamps.
- Screw-based CFL and screw-based LEDs.
- Mercury vapor lamps.
- Lighting systems which allows the addition or relocation of luminaires without altering the wiring of the system.
- LED light sources which have not been certified to the CEC.
- Lighting systems that allow conversion between high-efficacy and low-efficacy lighting without changing the luminaires' housing or wiring.
- Electrical boxes finished with a blank cover.

Switching devices and controls [150(k)2]

- High-efficacy luminaires must be switched separately from low-efficacy luminaires
- Exhaust fans must be switched separately from lighting systems
- Luminaires must be switched with readily accessible controls that permit manual on / off switching
- No controls may bypass a dimmer or vacancy sensor function

Lighting in kitchens [150(k)3]

A minimum of 50% of the total rated wattage of permanently installed lighting in kitchens must be high-efficacy lighting.

Exceptions:

- Up to 50 watts for dwelling ≤ 2,500 ft² or 100 watts for dwelling units > 2,500 ft² may be exempt from the 50% high efficacy requirement when **all** lighting in the kitchen is controlled by vacancy sensors or dimmers.

Lighting internal to cabinets [150(k)4]

Lighting in cabinets can use up 20W of lighting per linear foot of cabinet.

Cabinet length measured by one of the following:

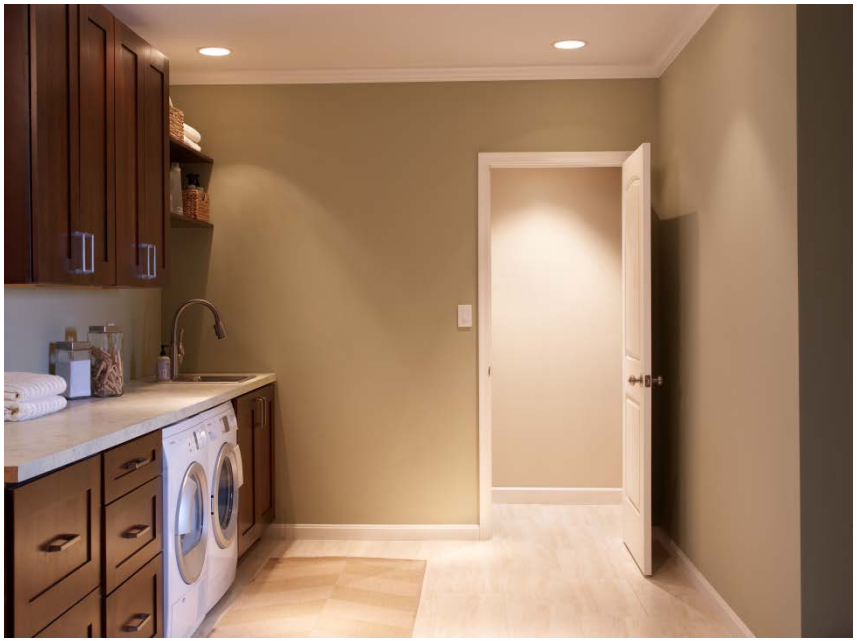
- One horizontal length of illuminated cabinet; or
- One vertical length, per illuminated cabinet section; or
- No more than one vertical length per every 40 horizontal inches of illuminated cabinet.

Lighting in bathrooms [150(k)5]

At least one high-efficacy luminaire in each bathroom. All other lighting must be high efficacy or controlled by vacancy sensors.

Lighting in garages, laundry rooms, and utility rooms [150(k)6]

Lighting installed in attached and detached garages, laundry rooms, and utility rooms shall be high efficacy luminaires **and** controlled by vacancy sensors.



Lighting in all other rooms (living rooms, TV rooms, bedrooms, hallways, etc.) [150(k)7]

Lighting installed all other rooms shall be high efficacy, or shall be controlled by either dimmers or vacancy sensors.

Exceptions:

- Luminaires in closets less than 70 ft^2
- Lighting in detached storage buildings less than 1,000 square feet

Outdoor lighting [150(k)9]

For single-family residential buildings, outdoor lighting must be high efficacy or controlled by all of the following:

- A manual on / off switch.
- A motion sensor
- A photocontrol, astronomical time clock, or energy management control system that automatically turns the outdoor lighting off during daylight hours.

More information on energy codes

For additional information

Code requirements:
Call the California Energy Commission (CEC):
Inside California 1.800.772.3300
Outside California 916.654.5106
http://www.energy.ca.gov/title24

Lutron energy codes website: www.lutron.com/energycodes

Questions?