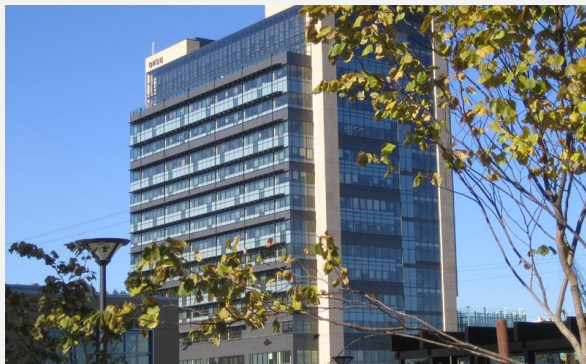




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BRIGHTWORKS™

CALGreen: A primer on California's green building code

Presented Thursday February 24, 2011

by

Marian Thomas, Sustainability Advisor
Brightworks Sustainability Advisors

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resources on our website:

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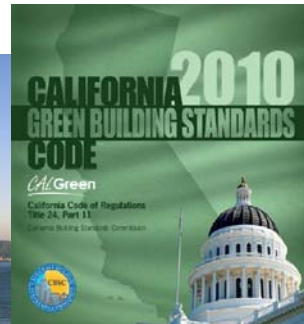
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CALGreen

A Primer on California's Green Building Code

Marian Thomas
February 24, 2011



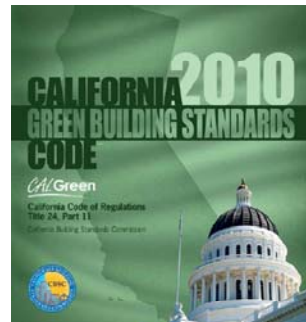
CALGreen: A Primer on California's Green Building Code

- 1 CALGreen – The Basics
- 2 CALGreen vs. LEED
- 3 CALGreen “On the Ground”
- 4 Compliance - Tips and Tricks



At the end of this course, attendees will be able to:

- Describe the background and basic fundamentals of CALGreen.
- Compare CALGreen to LEED Certification.
- Understand how CALGreen is being implemented by various cities throughout CA.
- Understand steps you can take to help ensure successful CALGreen compliance.



1 CALGreen: The Basics

Assembly Bill 32 (...where it all started)

AB 32 Global Warming Solutions Act of 2006

- Reduction of greenhouse gas (GHG) emissions to 1990 levels by 2020 (with Executive Order requiring 80% below 1990 levels by 2050.)
- Facilitated by the California Air Resources Board (CARB)
 - Develops Scoping Plan for measures/strategies
 - Sets GHG baseline level and targets
 - Enforces mandatory reporting of GHG emissions



Assembly Bill 32, cont.

AB 32 Scoping Plan - Recommended GHG reduction targets that relate to the built environment:

- 26.3 MMtCO₂e (million metric tons carbon dioxide equivalent) reduction is attributed to **Energy Efficiency and Green Buildings:**
 - **Building/appliance efficiency**
 - **Increase in CHP generation**
 - **Solar Water Heating**
- 5 MMtCO₂e reduction from Regional Transportation Related GHG Targets (SB 375)
- 2.1 MMtCO₂e to the Million Solar Roofs

Buildings are responsible for...

- 14% of potable water consumption
- 30% of waste output
- 49% of CO₂ emissions
- 40% of raw material use
- 50% of energy use
- 72% of electricity consumption



Source: Energy Information Administration. 2005. *Annual Energy Review*.

CALGreen – Background

First statewide mandatory green building code in the US.

- 2008 Initial Voluntary Standards – Effective August 1st 2009
- 2010 Mandatory Standards – Effective January 1, 2011
 - Part 11 of Title 24

Contributors:

- Building and regulatory officials, representatives from the construction industry, environmental community, and public.

Resources:

- Green Globes, LEED, Build it Green, CHPS, ASHRAE 189P, UC Berkeley Green Building

CALGreen – Background

Adopting State Agencies:

- California Building Standards Commission (BSC)
- The Department of Housing and Development (HCD)
- Division of the State Architect (DSA)
- Office of Statewide Health Planning and Development (OSHPD)



CALGreen – In a Nut Shell

- Mandatory requirements and voluntary measures
- At a minimum, requires all **new** buildings constructed in CA to:
 - Reduce water consumption
 - Divert construction waste from landfills
 - Install low-emitting materials
 - Commission new buildings over 10,000 sf.

Additional green building strategies will be required depending on the occupancy type and the governing agency:

- Healthcare – OSHPD
- Schools – Division of the State Architect (DSA)
- Residential housing – Department of Housing and Development (HCD)
- Commercial/Non-Residential - California Building Standards Commission (BSC)

CALGreen Measures

- Many measures in CALGreen are duplicates of other code requirements (e.g. Title 24 Energy Code, mechanical ventilation requirements).
- CALGreen has adopted some existing state-level requirements into the new green building code requirements (e.g. formaldehyde levels in insulation).
- CALGreen has also adopted some existing local ordinance requirements into the green building code (e.g. C&D waste recycling)

CALGreen – Classifying Your Project

CALGreen **Residential** Occupancies:

(All group R occupancies and projects governed by the HCD)

- Motels, hotels, lodging houses
- Low-rise apartment houses and condos (three stories or less)
- Single-family homes, duplexes, townhouses
- Dormitories, shelters, employee housing

CALGreen **Non-Residential/Commercial** Occupancies (BSC):

- All other NEW construction types (other than schools or hospitals)
- State owned buildings (university and community college included)
- *First time* tenant remodels

There are currently NO high-rise residential requirements in CALGreen.

CALGreen and Mixed Use Occupancy or Phased Projects

Mixed Use:

CALGreen requires that each portion of a mixed use building comply with the specific green building measures applicable to that occupancy.

- Chapter 4/Appendix 4 for Residential
- Chapter 5/Appendix 5 for Non-Residential

Phased (i.e. Core and Shell Retail)

When a building is constructed as a shell, only certain mandatory measures may be pertinent or applicable at initial construction phase (i.e. Construction Waste Diversion, Construction Activity Pollution Prevention Plan, etc.)

The **initial** tenant or tenant improvement applicant must implement the additional CALGreen mandatory measures to achieve full compliance with CALGreen.

BSC: Commercial/Nonresidential Mandatory Requirements

Chapter 5: Nonresidential Mandatory Measures

DIVISIONS

- 5.1 Planning and Design
- 5.2 Energy Efficiency
- 5.3 Water Efficiency and Conservation
- 5.4 Material Conservation and Resource Efficiency
- 5.5 Environmental Quality



5.1 Planning and Design – Mandatory Measures

Site Development

- Stormwater pollution prevention plan (SWPPP)
 - Now required for new projects less than one acre
 - Already required under the Clean Water Act for all projects one acre or more
- Bicycle parking
 - Short-term bicycle parking – 5% of visitor parking capacity
 - Long-term bicycle parking- 5% of total parking capacity
- Designated Parking for clean air vehicles (LEV/Carpool)
 - Marked stalls for 8% of total parking capacity (doesn't have to be preferred)

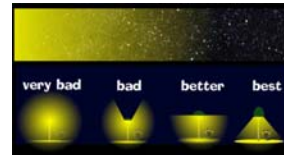


5.1 Planning and Design – Mandatory Measures

Site Development, cont.

- Light Pollution Reduction
 - Comply with CA Energy Code lighting standards
 - Design interior and exterior lighting such that zero direct-beam illumination leaves the building site

- Grading and Paving
 - Keep surface water from entering the building
 - Drainage plans and grading need to be shown on construction plans



5.2 Energy Efficiency– Mandatory Measures

Regulated by the California Energy Commission

- Mandatory provisions are found in Part 6 of Title 24 2008



5.3 Water Efficiency– Mandatory Measures

Indoor Water Use:

- Buildings over 50,000 sq ft must install separate sub-meters for the following:
 - Each individual leased, rented or other tenant space that will consume more than 100 gallons per day
 - Laundry, cleaners, restaurant, medical/dental office, lab, beauty salon.
 - Any building size with consumption over 1000 gallons per day
- 20% Over-all water use reduction over baseline fixtures
 - Baseline fixtures defined in section 5.303.2.2 of code
- 20% Wastewater reduction (through fixtures and/or water reuse)



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5.3 Water Efficiency– Mandatory Measures

Outdoor Water Use

- Water Budget for landscape areas 2,500 sf +
- Separate meters for outdoor potable water use for areas between 1,000 and 5,000 sf
- Weather or moisture responsive irrigation controls for areas between 1,000 and 2,500 sf



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5.4 Material Conservation & Resource Efficiency

Weather protection & moisture management

- Design for moisture control
 - Prevent Spray from sprinklers on structures
 - Prevent entries and openings from water intrusion

Construction Waste Reduction, Disposal and Recycling

- Establish a waste management plan
- Divert a minimum of 50% C&D waste from landfills
- Divert 100% of soil and land clearing debris (trees, stumps, rocks, etc.)



5.4 Material Conservation & Resource Efficiency

Building Maintenance and Operation

- Accessible recycling areas for glass, paper, cardboard, plastics, metal.
- Commissioning for new buildings 10,000sf and over (Cx requirements more or less identical to LEED)
- Testing and adjusting for new buildings under 10,000sf
 - Balancing of HVAC systems
 - Verification of compliance through owner sign off attesting that commissioning activities are completed.



5.5 Environmental Quality – Mandatory Measures

Fireplaces must be

- Direct-vent sealed gas fireplaces OR
- Sealed wood-burning fireplaces or woodstoves

Construction Activity Pollutant Control

- Seal duct openings
- Protect mechanical equipment during construction
 - Balancing of HVAC systems
 - Verification of compliance

Low-emitting Materials

- Adhesive, Sealants, Paints & Coatings, Flooring, etc.
 - Standards are primarily CA-based but are similar to LEED requirements

Environmental Quality – Mandatory Measures

Pollutant Control – During Occupancy

- Outside and return air filtration must be a minimum of MERV 8.
- Outside air delivery minimum in accordance with CA Energy Code.
- Buildings with demand controlled ventilation must install CO2 monitors in accordance with the CA Energy Code.
- Smoking prohibited within 25 feet of entries, windows, air intakes. Smoking prohibited indoors.

Environmental Comfort

- Acoustical control based on ASTM E90 and E413
 - Requirements for exterior noise transmission and interior sound

Ozone Depletion & GHG Reduction

- No CFCs or halons in HVAC or fire suppression systems

CALGreen – Nonresidential **Voluntary** Measures

- Detailed in Appendix A5 of the Code
- Similar to LEED Credits with some modifications or additions.
- Voluntary measures are not required by the state but are designed to be adopted by cities or counties in local ordinances.
 - Gives local jurisdictions the power to decide which measures they want to make mandatory.
 - Projects achieving additional prescribed and elective voluntary measures can earn a CALGreen Tier 1 or Tier 2 rating
 - Adopting more mandatory measures will help cities and counties meet their Greenhouse Gas Emissions reductions for the state (AB32).

2 CALGreen vs LEED (Oh No! Not Another Rating System!?)

CALGreen vs LEED

- CALGreen mandatory requirements are equivalent to achieving approximately 7 LEED points and 4 out of 9 prerequisites in LEED NC v3.
- Tier I would be closer to meeting a LEED Certified/Silver Equivalency depending on the voluntary measures chosen.

CALGREEN  LEED Certification

CALGreen vs LEED vs GPR Comparison charts and resources:
 USGBC NCC Chapter – Green Building Codes Resource Center
www.usgbc-ncc.org

AIA California Council website: aiacc.org

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CALGreen – Tiered Achievement

To achieve CALGreen Tier 1 or Tier 2, one must comply with the following:

- Meet all mandatory requirements;
- Exceed 2008 Energy Efficiency Standards by 15% or 30%
- Meet list of additional “voluntary measures” that become “mandatory”

AND comply with additional elective “voluntary” measures:

- 5 measures for Tier 1 (one from each division)
- 15 measures for Tier 2 (three from each division)

*In many cases, voluntary measures mimic or modify LEED credits.

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Non-Residential "Voluntary" Measures:

Tier I	Tier II
<ul style="list-style-type: none"> ▪ 10% parking for LEV/carpool vehicles ▪ Cool Roofs ▪ 1 "Site" elective 	<ul style="list-style-type: none"> ▪ 12% parking for LEV/carpool vehicles ▪ Cooler Roofs ▪ 3 "Site" electives
<ul style="list-style-type: none"> ▪ 15% better than T24 energy 	<ul style="list-style-type: none"> ▪ 30% better than T24 energy
<ul style="list-style-type: none"> ▪ 30% indoor water use reduction ▪ 40% outdoor water use reduction ▪ 1 "Water" elective 	<ul style="list-style-type: none"> ▪ 35% indoor water use reduction ▪ 45% outdoor water use reduction ▪ 3 "Water" electives

Non Residential "Voluntary" Measures, Cont:

Tier I	Tier II
<ul style="list-style-type: none"> ▪ 10% recycled content value in materials ▪ 65% diversion of C&D waste ▪ 1 "Materials" elective 	<ul style="list-style-type: none"> ▪ 15% recycled content value in materials ▪ 80% diversion of C&D waste ▪ 3 "Materials" electives
<ul style="list-style-type: none"> ▪ 80% resilient flooring is low-VOC ▪ Low-emitting composite wood/insulation ▪ 1 "IEQ" elective 	<ul style="list-style-type: none"> ▪ 80% resilient flooring is low-VOC ▪ ZERO Added Urea Formaldehyde in wood/insulation ▪ 3 "IEQ" electives
<ul style="list-style-type: none"> ▪ 1 additional elective from any category 	<ul style="list-style-type: none"> ▪ 3 additional electives from any category

Slight differences between LEED & CALGreen:

SITES

- Bike parking is based on *project occupancy* in LEED. CALGreen is based on *parking capacity*.
- LEV and carpool parking are two separate credits in LEED both requiring 5% of the parking capacity AND must be preferred parking spaces.
- Solar reflectance requirements to mitigate heat island effect on roofing are higher in LEED.

C&D WASTE

- CALGreen requires 100% reuse or recycling of site clearing and excavation debris.

MATERIALS

- LEED and CALGreen have different thresholds for Urea Formaldehyde limits.
- Slightly different standards governing low-emitting VOC limits.

COMMISSIONING

- CALGreen has less stringent requirements for who can commission the project.

CALGreen "Certification" Process

- No 3rd Party Review Team
 - Mandatory CALGreen provisions will be inspected and verified by local and state building departments.
 - CALGreen mandatory compliance will be addressed directly on construction documents and specifications.
- Levels of Achievement
 - Mandatory Measures (Prerequisites)
 - Property owners complying with only the mandatory measures can label their facilities as "CALGreen Compliant" once they pass city building inspections.
 - Voluntary Measures (Credits)
 - Projects achieving additional prescribed and elective voluntary measures can earn a "CALGreen Tier 1" or "Tier 2" rating
 - Voluntary measures may be inspected by a 3rd party reviewer

CALGreen – The Demise of LEED?

- According to the BSC, CALGreen is designed to set “minimum green building standards” and not a substitute for more stringent local, or private green building certification standards (i.e. LEED).
 - Ensures that green building measures are required in every jurisdiction in the state.
- Many municipalities, particularly those with limited building department capacity, have retained their LEED Certification requirements.
- Relying only on the state CALGreen code would likely lead to municipalities falling short of meeting AB32 emissions reductions. More stringent energy reduction targets will still be needed.

3 CALGreen on the Ground (What do I REALLY need to know?)

CALGreen – Municipal Adoption

CALGreen was developed to set a *minimum* green building standard throughout California.

CALGreen was **NOT** designed to simplify Green Building Requirements throughout California.

- Cities or counties have and will enact local ordinances establishing more restrictive green standards by filing amendments with the CA Building Standards Commission.
- **Currently, many large cities in CA have adopted some variation of CALGreen along with their existing Green Building Ordinance.**

Cities with Existing Green Building Ordinances

Albany	Long Beach	Palm Desert	Santa Clara
Brisbane	Los Altos	Palo Alto	Santa Cruz
Calabasas	Los Altos Hills	Pasadena	Santa Monica
Cotati	Los Angeles	Pleasanton	Santa Rosa
Culver City	Marin County	Redwood City	Sebastopol
Davis	Mill Valley	Rohnert Park	Sonoma
Dublin	Morgan Hill	San Francisco	Tiburon
Hayward	Napa	San Jose	Union City
Healdsburg	Novato	San Mateo	Windsor
Livermore	Oakland	Santa Barbara	W. Hollywood

City of San Francisco

“The CALGreen/LEED/GreenPoint Rated combo package”

Project types requiring LEED or GREEN POINT RATED CERTIFICATION OR EQUIVALENCY*:

- New Large Commercial Construction (at least 25,000 sq ft)
- New High-Rise Residential (5+ units and at least 75' height)
- **First-time** Commercial Fit-outs
- Commercial Major Alterations** (at least 25,000 sq ft)
- Residential Major Alterations (at least 25,000 sq ft)

BUT IT DOESN'T STOP THERE.....

*Equivalency requires “Green Building Compliance Professional of Record” sign off.

**Major alterations” must include interior renovations, structural upgrades, and some degree of MEP improvements.

CALGreen: A Primer on California’s Green Building Code

City of San Francisco, cont.

New Large Commercial or New High-Rise Residential must also demonstrate compliance with specific LEED credits AND CALGreen mandatory and voluntary requirements:

- 75% Construction and Demolition Waste Diversion
 - 15% Energy savings over T24 2008
 - 30% water use reduction
 - Stormwater Management (SSc6.1 and/or SSc6.2)
 - Designated LEV/carpool parking for 8% of parking capacity (CALGreen)
 - Outdoor irrigation submetering (CALGreen)
 - Low-emitting materials
- AND MORE.....

Major Commercial Alterations have similar but less stringent additional credits and requirements.

CALGreen: A Primer on California’s Green Building Code

City of Sunnyvale

Residential – GreenPoint Rated (minimum of 70 points) and all CALGreen mandatory measures.

- Verification by City Staff as part of plan sets. **Density bonuses for projects achieving over 100 points.**



Non-Residential projects – Complete LEED Checklist (minimum LEED Silver for larger projects) and all CALGreen mandatory measures required.

- Verification can be done by either LEED AP/Green Point Rater or by City Staff for smaller projects; **Density bonuses are provided to projects undergoing full USGBC Certification.**

City of Palo Alto

Adopted CALGreen with Amendments:

Non-residential

- New construction (+1,000 sq ft with HVAC system): Requires Tier II compliance with 15% Energy Reduction (as opposed to 30%)
- Tenant Improvement (over 5,000sf): Requires Tier I compliance

Residential

Multifamily or Single-family +1,250sqft must use Green Point Rated

ALL Projects not falling into the scopes above must meet CALGreen mandatory provisions with additional prescribed voluntary measures.



City of Los Angeles

No longer requires LEED Certification. In December of 2010, LA adopted CALGreen Tier 1 requirements for residential and non-residential projects.

Density bonuses and expedited permitting are available to projects for meeting additional CALGreen voluntary requirements.



City of Oakland

- All projects need to comply with CALGreen mandatory measures where applicable.
- New single family residential: Green Point Rated or LEED H Certification Required (One and Two Family Dwellings)
- New multi-Family: Green Point Rated or LEED NC Certification
- Commercial Projects at least 5Ksf must achieve LEED Certification, including alterations and renovations.
- Smaller commercial projects need to submit a checklist.



The CALGreen/LEED/Green Point Rated Ordinance:

City of Sunnyvale
City of Palo Alto
City of San Jose
County of Santa Clara
City of Cupertino
City of Oakland
AND OTHERS

The CALGreen Only Ordinance:

City of Los Angeles
County of San Diego

4 Tips and Tricks
(7 Steps for Success)

Recommendations

7 Steps to ensure hassle-free CALGreen compliance:

1. Check with building department FIRST.
2. Determine if occupancy scope and size triggers ordinance.
3. Confirm what variation of CALGreen/LEED or Green Point Rated rating system may be used.
4. If a requirement seems impractical or infeasible, ask for variance and offer alternatives.
5. Don't assume LEED Certification alone is enough.
6. Don't assume LEED "equivalency" is straightforward.
7. Include all LEED/GPR and/or CALGreen requirements directly on construction drawings and in specifications – even if opting for USGBC review. Reference CD page numbers in one CALGreen/LEED index or spreadsheet for easy review.

CALGreen Resources

Codes, guides, and checklists:

Non-residential: www.bsc.ca.gov/calgreen

Residential: www.hcd.ca.gov/CALGreen.html

Educational resources and webinars:

US Green Building Council Northern CA Chapter (USGBC NCC)
www.usgbc-ncc.org

AIA California Council
www.aiacc.org

Questions?



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