Greening the Codes

CALGreen versus LEED

Repercussions of Building Green Seen and Unforeseen

The Seminar Group

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Board of Directors

U.S. Green Building Council LA Chapter

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AGENDA

- Importance of green codes and third party standards
- CALGreen
- USGBC & LEED
- CALGreen vs. LEED
- Code Limitations and Outcome Based Codes

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Greening the Codes

“There is a continuing dynamic relationship between voluntary building performance programs and codes. It’s not a matter of having one or the other; it’s a matter of finding a good balance between them.”

Doug Seiter

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Opportunity!

"Greater building efficiency can meet 85% of future U.S. demand for energy, and a national commitment to green building has the potential to generate 2.5 million American jobs."

President Obama's "Better Buildings Initiative"

The Built Environment is Responsible For

- 2/3 of Total U.S. Electricity Consumption
- 1/8 of Total U.S. Potable Water (15 Bill Gallons/Yr)
- 1/3 of the WORLD's Energy Consumption
- 2/5 of the WORLD's Raw Materials (3 Bill Tons/Yr)
- 1/3 of the WORLD's CO_2 Emissions!

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Putting Green Codes and LEED into perspective…

"*If all the LEED buildings registered today (35,000) were net zero, it would only equate to a 1% energy savings of all the existing buildings in the US!*"

Courtesy of CTG Energetics

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Raising the Floor

While green building rating systems such as LEED have been designed to benchmark above-code leadership for buildings that intend to go beyond the minimum, it is equally important to complement this leadership with stronger, more comprehensive building codes.

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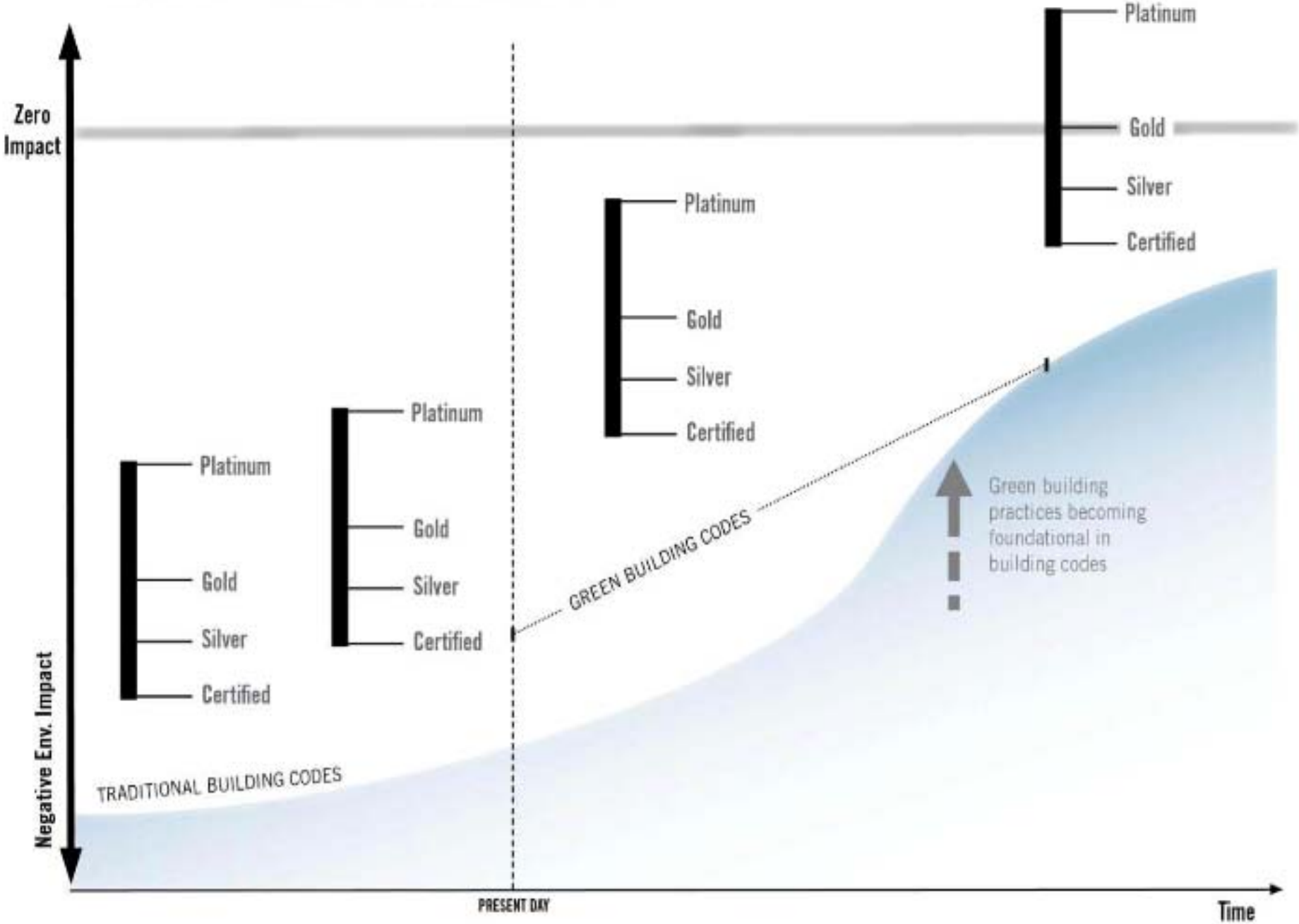
Progress Toward Sustainability



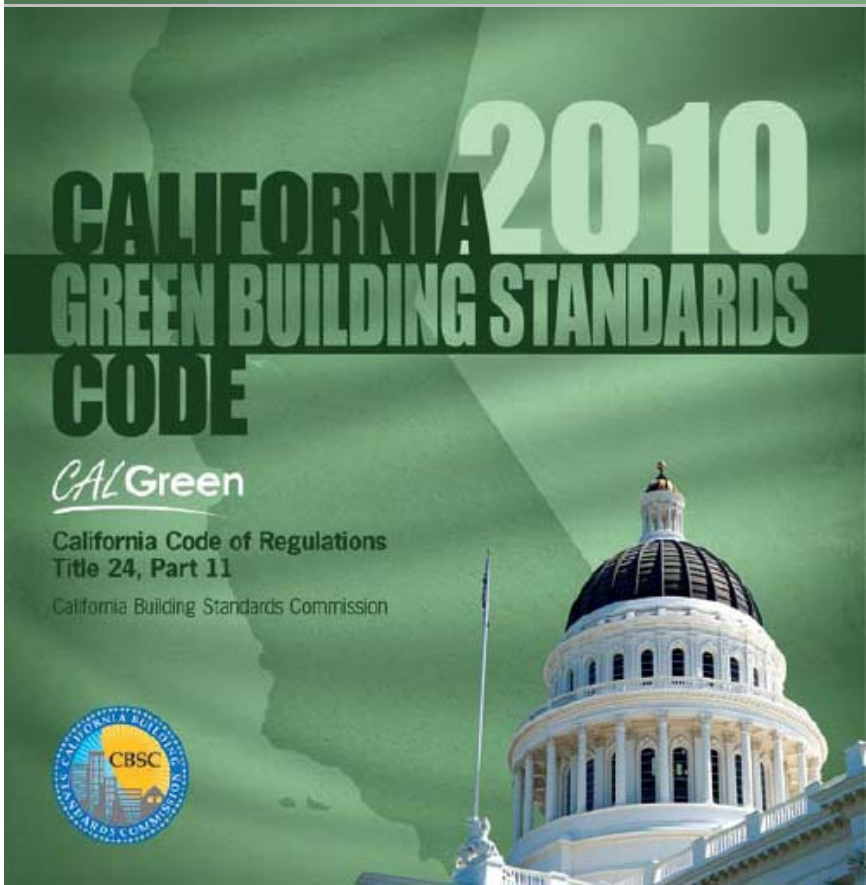
For more on USGBC's work on green building codes, read USGBC's white paper, *Greening the Codes*.

CALGreen

- The green building standards section of Title 24, the California Building Standards Code
- Sections for residential, non residential, schools, and healthcare
- Took effect January 1, 2011
- Goals to achieve major reductions in greenhouse gas emissions, energy consumption, and water use
- In addition to mandatory requirements, it offers elective requirements that can be used to achieve “Tier I” and “Tier II” status
- Designed to provide clarity in the definition of green building and the context of CA’s GHG emission reduction goals under AB 32
- Upon passing building inspection, property owners can label their facilities as *“CALGreen Compliant”*

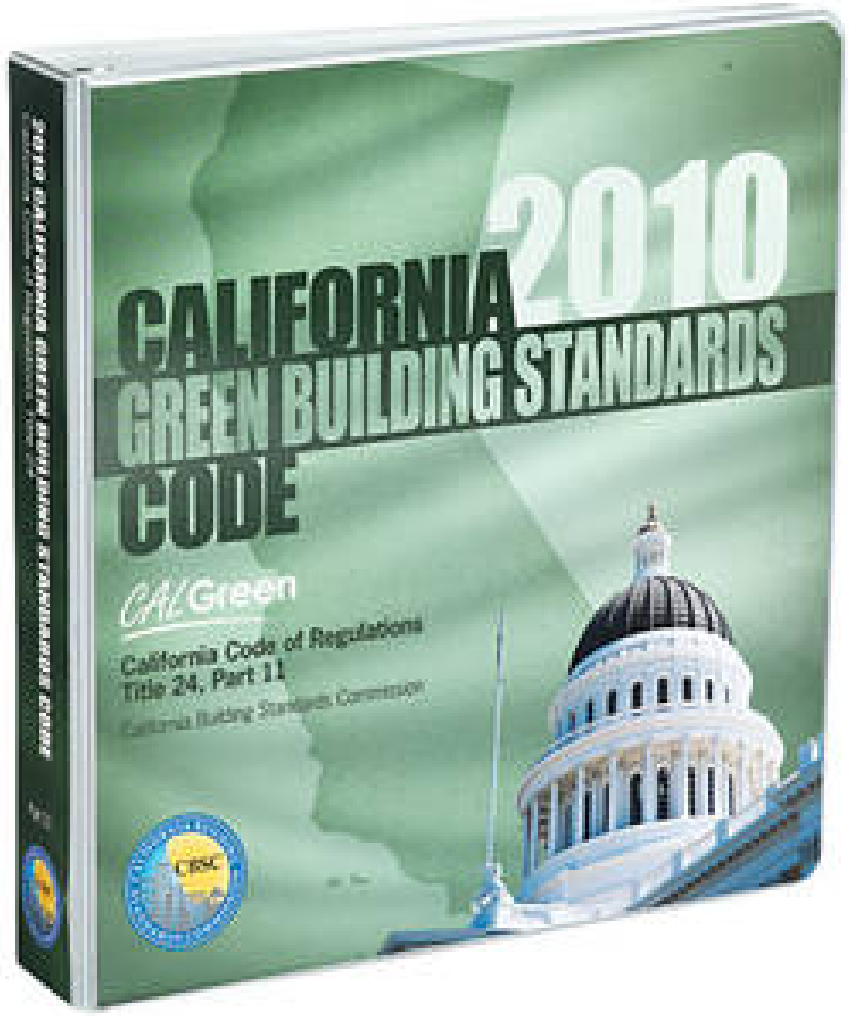
Evolution of the previous voluntary CA Green Building Standards into part of the mandatory building code

Title 24-envisions Zero Net Energy as standard



Significance of CALGreen

- First mandatory statewide green building standards code in the US
- One of the first pieces of California's AB 32 greenhouse gas emission reduction regulatory process to be fully adopted and implemented
- California Air Resources Board estimates that the mandatory provisions will result greenhouse gas emission reductions of 3 million metric tons of CO2 equivalent in 2020



CALGreen Requirements

- 20% mandatory reduction in indoor water use
- Separate water meters for nonresidential buildings' indoor and outdoor water use
- Moisture-sensing irrigation systems for larger landscaping projects
- Diversion of 50% of construction waste from landfills
- Mandatory inspections of energy systems, such as heat furnaces, air conditioners, and mechanical equipment, for nonresidential buildings over 10,000 sq. feet
- Low-pollutant emitting interior finishing materials, including but not limited to carpet, paint, vinyl flooring, and particle board

Market context surrounding CALGreen

California System Wide Targets:

AB32-Reduce state-wide GHG emissions

SB375-Low carbon community development strategies

AB1103-Building energy labeling/benchmarking requirements

Title 24 envisions Zero Net Energy as standard

- **LEED**-Continuing to evolve to higher stringency
- Economy struggling to emerge from recession
- Massive venture capital into Cleantech / Greentech
- Restart of the housing construction market

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U.S. Green Building Council

With a community comprising 79 local affiliates, 16,000 member companies and organizations, and more than 157,000 LEED Professional Credential holders, USGBC is the driving force of an industry that is projected to contribute $554 billion to the U.S. gross domestic product from 2009-2013.

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Almost 70 countries have established Green Building Councils

USGBC on CALGreen

"The adoption and enforcement of greener baseline building standards and codes advances USGBC's mission to transform the way our industry designs, constructs and operates buildings."

"The combination of greening base codes and LEED's performance-based approach provides California jurisdictions with an opportunity to take advantage of the benefits of both an improved baseline in the California codes and above-code, third-party rating systems."

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USGBC Codes White Paper: www.usgbc.org/government

LEED Certification

Leadership in Energy & Environmental Design: Leading-edge system for certifying design construction and operations of green buildings.

- Allows for approaching green building holistically
- Cost of certification is decreasing over time
- It is more difficult to verify and market green building claims without certification
- LEED Certification makes it easy to communicate sustainability goals with the team
- LEED energy efficiency awards are aligned with building owners goals of reducing operating expenses
- In 5 years of less class A buildings that are not certified may be less competitive.

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Four levels of Certification:

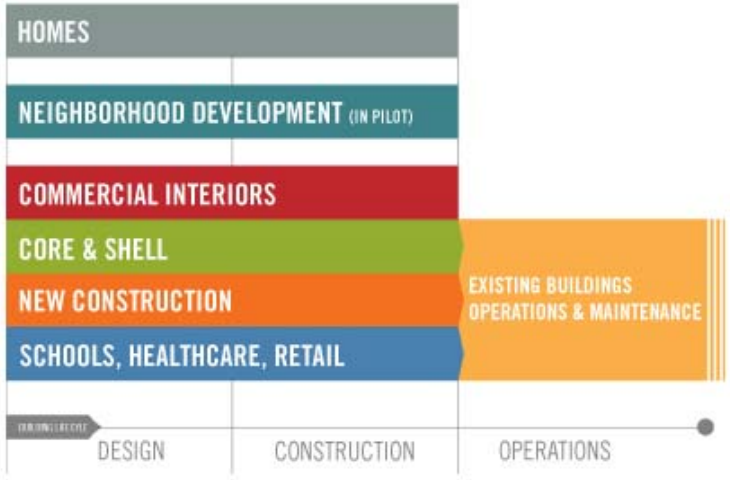
- Platinum
- Gold
- Silver
- LEED certified

LEED Credit Categories

- Integrated Process*
- Location and Transportation*
- Sustainable sites
- Water efficiency
- Energy and atmosphere
- Material and resources
- Indoor environmental quality.
- Performance*
- Innovation
- Regional Priority

** New proposed categories for 2012 version*

Established LEED Rating Categories



Source: US Green Building Council, website: http://www.usgbc.org/

LEED / Voluntary Standard

The LEED program was originally intended as a voluntary, rating system. Starting around 2005, localities and states began to require LEED certification for building projects within their jurisdiction. The LEED program was not intended for this purpose.

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Leading by Example

135 local governments, 26 state governments and 12 federal agencies or departments have committed to sustainable building practices by benchmarking the performance of their public buildings with LEED

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Establishing Incentives

Jurisdictions should consider supporting green building practices by providing structural, financial or other incentives for commercial building projects that are willing to take steps beyond code minimums.

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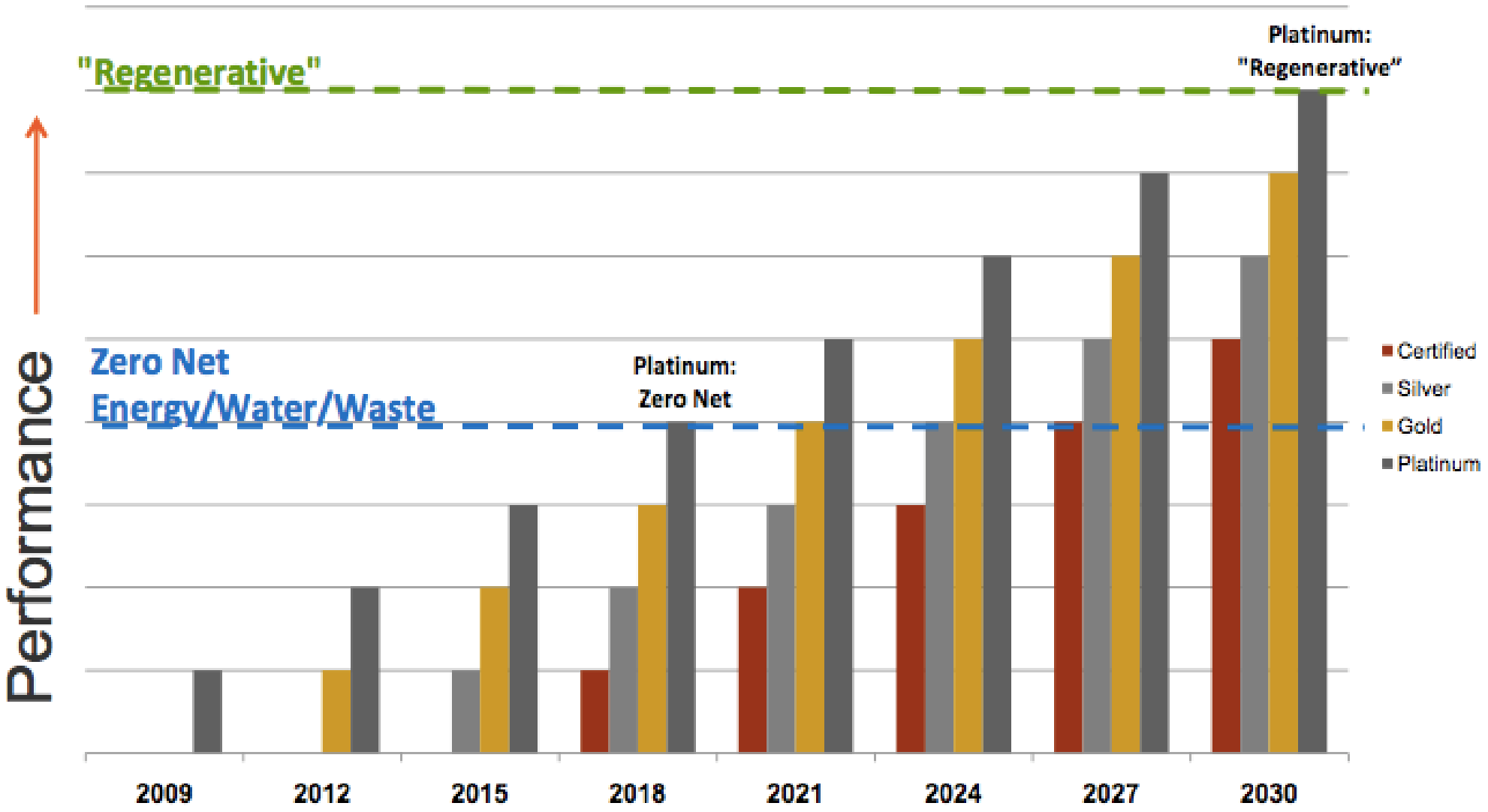
For a full list of green building incentive policy options:
See USGBC's list of Green Building Incentive Strategies:
http://www.usgbc.org/ShowFile.aspx?DocumentID=6247

Where is LEED Headed?



CALGreen vs. LEED Scorecard Non-Residential

Analysis by CTG shows that the mandatory measures in CALGreen satisfy **10** LEED credit points (minimum 40 pts for certification)

CAL Green may not satisfy all LEED prerequisites:

- EA prerequisite 2 requires 10% better than ASHRAE 90.1-2007 (or California T24-2005)
- Compliance with T24-2008 has not been determined to equal 10% better than ASHRAE 90.1-2007

Depending on which electives are chooses, TIER II can satisfy an additional 25-40 LEED Credit

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Courtesy of CTG Energetics

The Structures of LEED and CALGreen are Necessarily Different…

LEED	CALGreen
Prerequisites and Credits	Mandatory and Voluntary measures
Rating Levels corresponding to # points earned	Option of meeting Tier I/II by choosing set # of Electives
Third Party certification	Local jurisdiction code enforcement
Certification fees	Cost burden on local jurisdictions (pass thru?)
Flexible timing to achieving certification	Code compliance checked at set construction milestones

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Courtesy of CTG Energetics

Resource: http://sustainableindustries.com/articles/2011/03/calgreen-versus-leed

What are the benefits/risks of making direct comparisons between LEED and CALGreen

Measures	LEED - NC	CALGreen Non-Residential
Energy Use	Can use CA Title24, but must use ASHRAE energy modeling protocols	Title 24 modeling protocols do not match ASHRAE
Monitoring & Verification	Requires a Plan that includes metering & implementation actions	Requires metering
Outdoor Water Use	Requires 50% savings thru combination of plant species, efficiency, reuse	Smart controllers are mandatory; 40%-45% savings for Tier I & II

Conclusion: the CALGreen measures MAY satisfy LEED credits, but not guaranteed

Courtesy of CTG Energetics

First Cost of LEED vs. CALGreen

Example $8 million commercial office (20,000 sf)*

	LEED: BD+C	CALGreen Tier 1*
• Hard Costs		
– Registration:	$ 900	$ 0
– Certification:	$ 2,250	$ 0
– Commissioning:	$25,000	$25,000
• Soft Costs (Alameda County):		
– Energy Efficiency (15% for both):	$44,600	$44,600
– Documentation:	$15,000	$8,000
– Consultants/Inspectors:	$10,000	$5,000
TOTAL:	$97,750 (1.2%)	$82,600 (1.0%)

* Even if documented and verified to LEED Standards, Tier 1 does not meet the minimum 40 points necessary for LEED Certification. CALGreen Tier 1 would possibly earn 20-30 LEED points depending on Tier measures chosen and equivalency of verification/documentation standards.

Courtesy of Green Building Alameda County

Cost or ROI?

Benefits of LEED & Green Buildings are increasing

	2005	2009
Decreased operating costs	8-9%	13.6%
Increased building values	7.5%	10.9%
Improvement in ROI	6.6%	9.9%
Increased occupancy	3.5%	6.4%
Rises in rent	3.0%	6.2%

Source: McGraw-Hill Construction's 2009 Green Outlook

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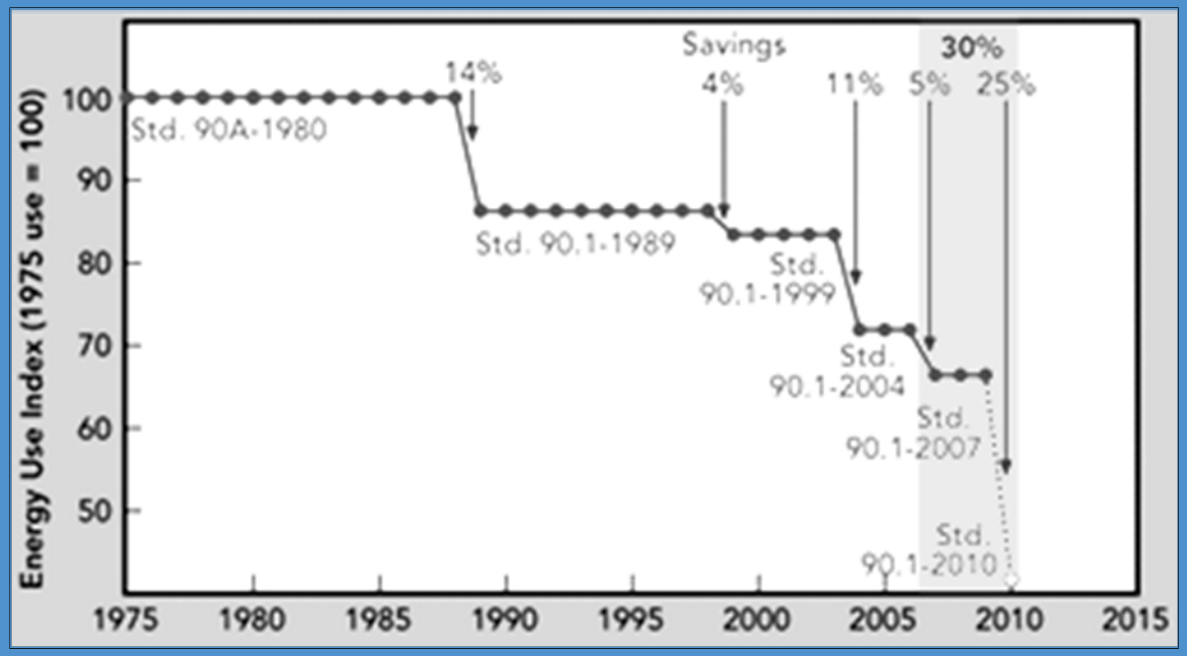
From Cutting Edge to Common Practice

Green Building Rating Systems Contribute to Energy Efficient Building Codes

Brief History of Commercial Codes



http://usgbcblog.blogspot.com/2011/02/from-cutting-edge-to-common-practice.html

Green building rating systems have had major successes in driving the market to demand better buildings.

As early as 2000, LEED building owners were realizing the benefits of higher occupant satisfaction, decreased water and energy use, and the improved marketability of a recognized brand that provides meaningful third-party verification for better building design and construction.

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Code Limitations

- Modeled vs. actual energy use-highly variable for individual buildings
- “Percentage better than code” metric is not meaningful because it only compares energy usage with a hypothetical computer model vs. actual total building energy use
- No relationship or accountability for actual long term building performance
- For existing buildings, code may focus on the wrong aspects of performance
- No way to address tenant loads or behavior

Source: Jim Edelson, NBI New Buildings Institute

- Existing code structure can be a barrier for Innovation
- Systems integration approach to project development is not recognized in codes
- Truly Green Buildings require efficient operations and green occupant innovation: high performance design and construction only takes you so far.

Source: Gerdin Edlen Development

Outcome & Performance based codes

An alternative building energy & water efficiency regulatory framework-based on accountability for achieving actual post-retrofit performance outcomes rather than following a prescriptive code path or predicting results

- Benchmarking
- Metering/Feedback
- Effective commissioning
- Disclosure and Comparison
- Annual Reporting

Enforcement Mechanisms

- Performance Bonds
- Utility Rate Acceleration
- Tax/ Appraisal Structure
- Annual Inspection
- Outcome Requirements

Source: Jim Edelson, (NBI) New Buildings Institute & City of Seattle / http://www.seattle.gov/dpd/greenbuilding/

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