

# *Sustainability and the CHBC*

*Mark C. Huck, AIA, LEED AP*

*The Use and Application of the  
California Historical Building Code*

*Oakland, CA*

*July 31, 2009*



# **In this Presentation:**

- **Energy Changes to the 2007 CHBC from the 2001 CHBC**
- **Local responses to voluntary and required sustainable goals**
- **Build It Green new and existing standards**
- **A quick tour of the new Green Codes, Title 24 Part 11**
- **LEED accommodations to Preservation**
- **Solar Rights Act Case Study**

## Health and Safety Code, Division 13, Part 2.7, Sections 18950-18961

•**18951.** It is the purpose of this part to provide alternative regulations and standards for the rehabilitation, preservation, restoration (including related reconstruction), or relocation of qualified historical buildings or structures, as defined in Section 18955. These alternative standards and regulations are intended to facilitate the rehabilitation, restoration, or change of occupancy so as to preserve their original or restored architectural elements and features, to encourage energy conservation and a cost-effective approach to preservation, and to provide for the safety of the building occupants.

# Changes from the 2001 *Code*

## Mechanical, Plumbing and Electrical Requirements

**2007 8-901.5 Energy conservation.** Qualified historical buildings or properties covered by this part are exempted from compliance with energy conservation standards. When new non-historical lighting and space conditioning system components, devices, appliances and equipment are installed, they shall comply with the requirements of Title 24, Part 6, *The California Energy Code*, except where the historical significance or character-defining features are threatened.

**2001 8-901.5 Energy conservation.** Historical buildings covered by this part are exempted from compliance with energy conservation standards. When appliances and equipment are added, they should comply with the regular code.

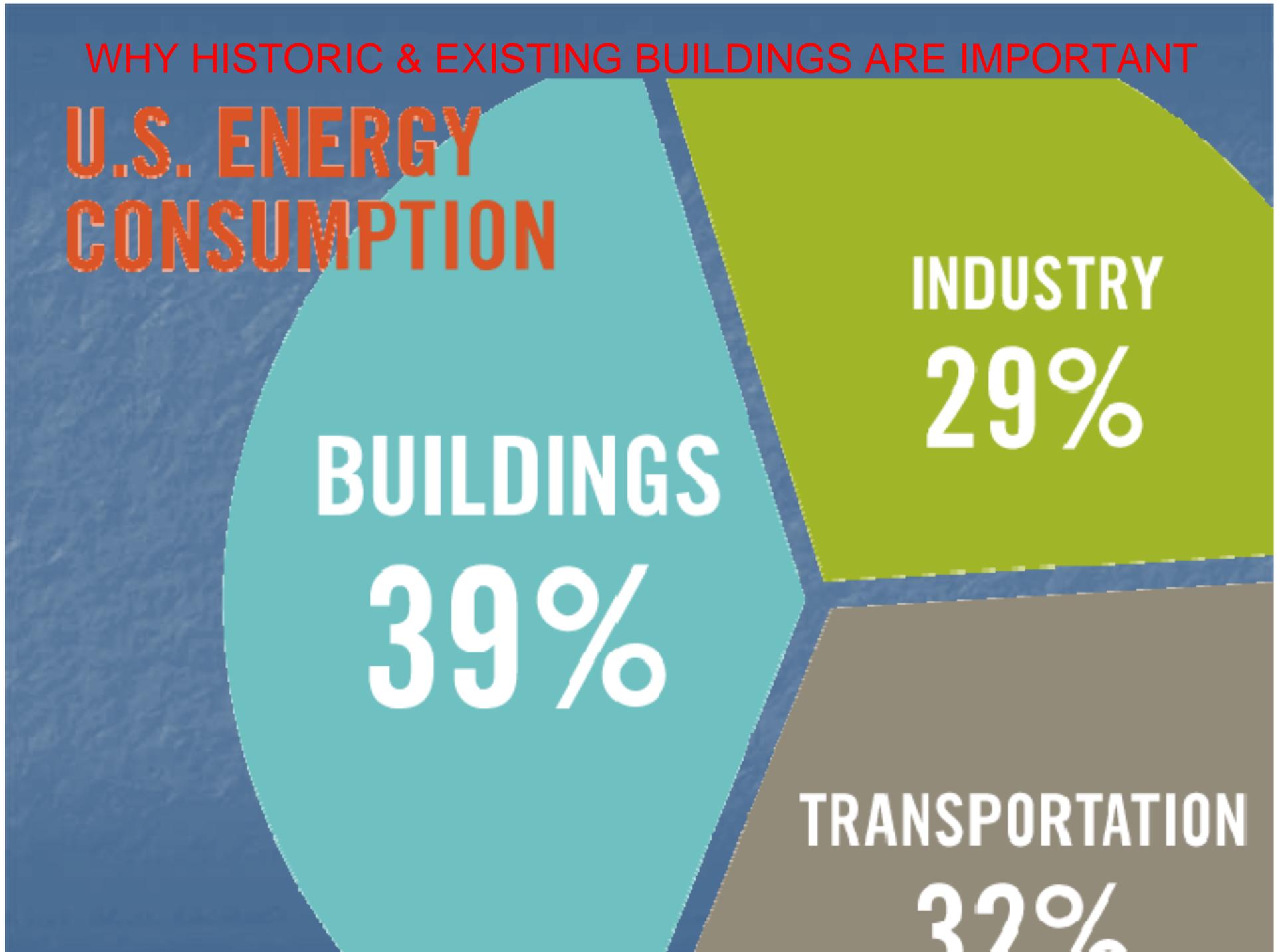
WHY HISTORIC & EXISTING BUILDINGS ARE IMPORTANT

# U.S. ENERGY CONSUMPTION

**BUILDINGS**  
**39%**

**INDUSTRY**  
**29%**

**TRANSPORTATION**  
**32%**



# WHY HISTORIC & EXISTING BUILDINGS ARE IMPORTANT

## Historic Buildings Nationally

AREA: Residential Buildings



California 17%

Residential Building Inventory  
U.S. Census Bureau

# WHY HISTORIC & EXISTING BUILDINGS ARE IMPORTANT

The New York Times

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July 30, 2009

## Efficiency Drive Could Cut Energy Use 23% by 2020, Study Finds

By [KATE GALBRAITH](#)

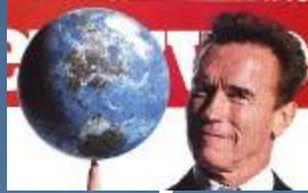
The biggest opportunity to improve the nation's energy situation is a major investment program to make homes and businesses more efficient, according to a study released Wednesday by the consulting firm McKinsey. An investment of \$520 billion in improvements like sealing ducts and replacing inefficient appliances could produce \$1.2 trillion in savings on energy bills through 2020, the study found.

The [report](#) said such a program, if carried out over the next decade, could cut the country's projected energy use in 2020 by about 23 percent, a savings that would be "greater than the total of energy consumption of Canada," Ken Ostrowski, a senior partner in McKinsey's Atlanta office, said at a forum in Washington on Wednesday. It would also more than offset the growth in energy use that would be expected otherwise.

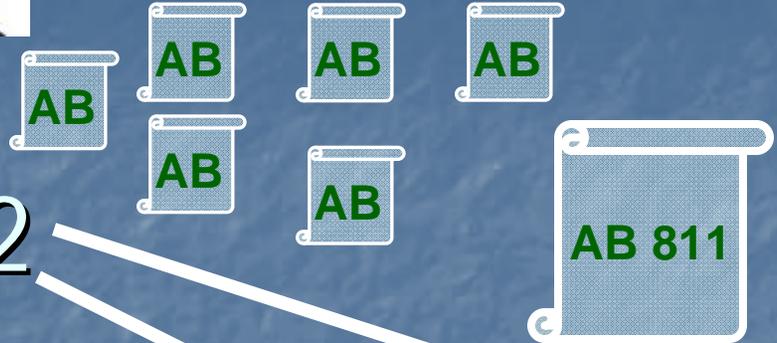
"The scale is vast if we can put together the means to pursue it," Mr. Ostrowski said.

Homes account for about 35 percent of the potential efficiency gains, according to McKinsey, while the industrial sector accounts for 40 percent and the commercial sector 25 percent. The report included only

# Executive Order



# S-20-04



## AB 32

### Resources Agency

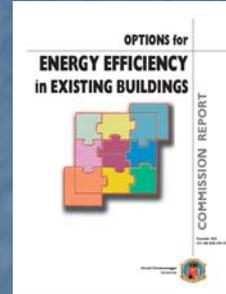
### ARB

### CEC

### BSC

### CEQA

Monitors and reduces GHG



### CHBC Part 8

### Green Code Part 11

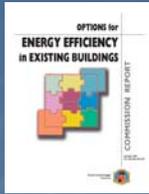
### Energy Code Part 6

### Green Code Part 11

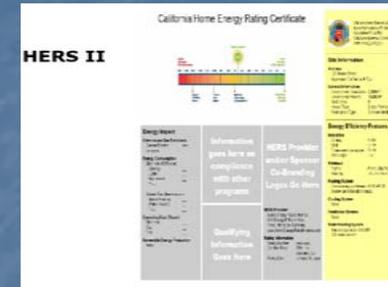
GENERAL PLAN

# OPTIONS FOR ENERGY EFFICIENCY IN EXISTING BUILDINGS

## 5 RESIDENTIAL STRATEGIES



- Time of Sale Information Disclosure by 2010
  - Includes Home Energy Ratings System score
- Information Gateway
  - Utility efficiency information clearinghouses that
    - inform homeowners of energy efficiency actions, programs and services
    - Targets high peak demand and high energy-use homes
    - Facilitates residential benchmarking
- Integrated Whole Building Diagnostic Testing and Repair
  - Finds and corrects flaws in construction or operation
  - Increases energy efficiency and health and comfort
- Assistance to Affordable Housing
  - Triggered at rehabilitation and equipment replacement
- Equipment Tune-Ups
  - Increased frequency and effectiveness of HVAC system tune-ups



# RESPONSIBLE ENERGY UPGRADES TO HISTORIC BUILDINGS

## Step 1: Quantification

California Building Performance  
Contractors Association

**cbpca**



February 24, 2009

Environment

### Weathering The Times: Stimulus Boosts Green Jobs

by Christopher Joyce

 [Listen Now](#) [4 min 49 sec] + add to playlist



John W. Poole/NPR

The stimulus funds should boost business for people like Bob Logston. His company, Home Energy Loss Professionals, retrofits homes to save energy and money.

#### Weatherizing Your Home

Check out tips from the Maryland Energy Administration for saving energy and money by [weatherizing your home](#).

Learn more about getting financial assistance to weatherize your home from the [U.S. Department of Energy](#).

*All Things Considered*, February 23, 2009 · People in the business of weatherizing homes are expecting to profit from the new economic stimulus plan. The federal aid package sets aside \$5 billion worth of spending for making homes and buildings more energy efficient. The idea is to save energy, create jobs — and even perhaps slow global warming.

That's good news for people like Malcolm Woolf, who runs the Maryland Energy Administration. It's a small office with a small staff, and they've started a new program to train people in need of work how to weatherize homes, such as installing weatherstripping around doors, insulating attics and basements, or making heating and cooling systems more efficient.

"We are training folks every week to become home energy retrofit professionals," says Woolf. "Construction workers can be easily retooled to be air-duct or insulation installers and meet our current needs."

Maryland has also spent hundreds of thousands of dollars over the past 10 months helping low- and moderate-income homeowners pay for retrofitting. The state's energy department will pay up to \$5,000 for qualified families to weatherize.

Woolf expects the federal stimulus package to boost his budget tenfold. That means new work for Bob Logston, whose company, Home Energy Loss Professionals, does a lot of the Maryland program's retrofit work.

"Back in the day, real estate people didn't want people to know that their homes weren't energy efficient," says Logston. "Now, they want people to be more energy efficient."

New homeowner Princess Moorman is one of about 50 Marylanders who has qualified for retrofitting for her north Baltimore three-story house. It was built in the 1920s, and although it's been renovated, it's drafty. Moorman says her January heating bill was \$500.

Logston and his three-man crew recently spent a day going over Moorman's house. By running a big exhaust fan that pulls air out of the house, they create a low-pressure zone inside that draws cold air into the house through cracks



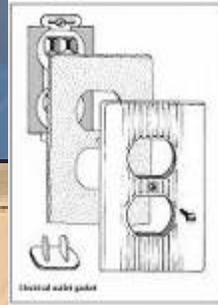
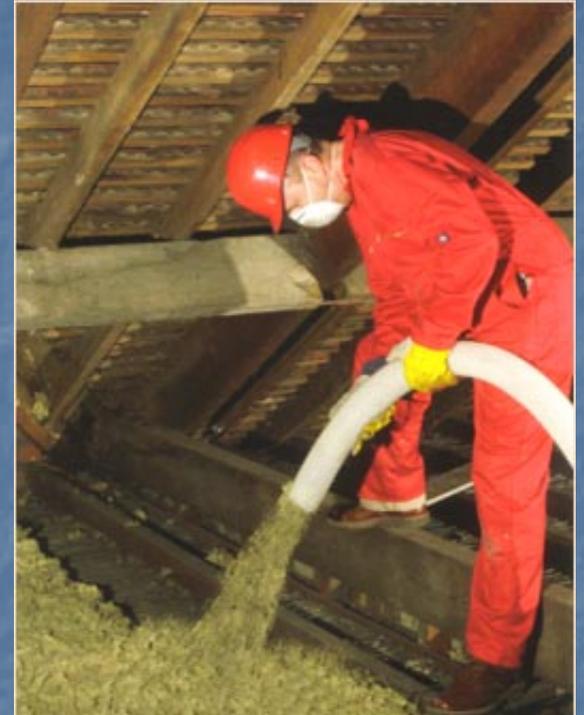
# RESPONSIBLE ENERGY UPGRADES TO HISTORIC BUILDINGS

## Step 1: Quantification



# RESPONSIBLE ENERGY UPGRADES TO HISTORIC BUILDINGS

## Step 2: Installation



# Local Ordinances

## SAN FRANCISCO MODEL GREEN ORDINANCE

The [San Francisco Green Building Ordinance Chapter 13c](#) is notable in that:

- It discourages demolition by increasing subsequent construction to increase the required LEED points by 10% or increases GreenPoint Rated™ points by 25.
- It further discourages demolition by adding one credit for LEED MR3, MR4, MR5, MR6, or MR7; two credits in 2012.
- Additional points or credits are granted for retention and in-situ reuse or restoration of certain character-defining features that conform to the SOIS.
- Exemptions are granted if the Director determines that compliance would impair the structure's integrity.

# Local Ordinances

## PALO ALTO MODEL GREEN ORDINANCE

The [Palo Alto Green Building Ordinance](#) is notable in that:

- It recognizes the embodied energy in existing buildings.
- It reduces the number of GreenPoint Rated™ checklist points by up to 20 points in residential projects that are designated on the City's Historic Inventory, and for structures eligible for the National Register of Historic Places, provided the proposed construction is found consistent with the Secretary of the Interior's Standards for Rehabilitation.
- Exemptions for compliance may be granted based on a demonstrated conflict between historic preservation goals and sustainability goals.
- Provides for future reports to be written by the Architectural Review Board and others to evaluate the results of the implementation of this ordinance.

# JURISDICTIONS PROMOTE BETTER ENERGY PERFORMANCE



## EIP - Palm Desert Energy Improvement Program

AB 811 amends Sections 5898.12, 5898.20, 5898.22, and 5898.30 of the Streets and Highways Code, and adds Sections 5898.14 and 5898.21 relating to contractual assessments, allowing local jurisdictions to raise and disburse funds to finance energy equipment and conservation measures.

Loan document that describes the loan for a renewable energy system or energy efficient equipment as an assessment to the property pursuant to Section 5898.30 of the California Streets and Highway Code.

Assessment or from the administration or registration of any associated bonds or reserve or other related funds (the "Annual Administrative Assessment"). The Annual Administrative Assessment shall not exceed \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) per year. The Assessment and the Annual Administrative Assessment, and the interest and any penalties thereon shall constitute a lien on the Property until they are paid. The installments of the Assessment and the Annual Administrative Assessment (including principal and interest) shall be collected on the property tax bill pertaining to the Property, and shall be subject to the same penalties, remedies, and lien priorities as for property taxes in the event of non-payment. The Borrower hereby expressly consents to the levy of the Assessment and the Annual Administrative Assessment and the imposition of the lien on the Property as described herein and in the Act.

(e) The amount of assessment installments that will be placed on the Property each year is set forth in Exhibit "C" attached hereto and incorporated herein by this reference.

(f) The Assessment may be prepaid, in whole or in part, at any time upon the payment of a premium in an amount equal to three percent (3%) of the amount of the Assessment to be prepaid.

### **2. Use of Proceeds.**

All proceeds of the Loan shall be used by Borrower for the sole purpose of paying for the reasonable costs and expenses of the Work on the Property, and in connection therewith the Borrower shall comply with all requirements set forth herein, in the Application and in the Report.

### **3. Disbursement Procedures.**

(a) Notwithstanding anything to the contrary contained herein, the City shall have no obligation to disburse the Loan Amount hereunder unless and until each of the following conditions is satisfied, or any such condition is expressly waived by the Director:

(i) The receipt by the Director of a written certification from Borrower, and the contractor(s), if any, that performed the Work, stating that the Work for which disbursement is requested is complete, and the actual cost of such Work. Such certification shall be in form and substance acceptable to the Director.

(ii) An inspection of the Work by the OEM, and a determination by the Director that the Work has been completed in full compliance with the requirements of the Loan Documents.

(iii) The receipt by the Director of such other documents and instruments as the Director may require, including but not limited to, if applicable, the sworn statements of contractor(s) and releases or waivers of lien, all in compliance with the requirements of applicable law.

# JURISDICTIONS PROMOTE BETTER ENERGY PERFORMANCE

## RECO – Berkeley Residential Energy Conservation Ordinance

- Adopted in 1985 with the intent of increasing the energy and water efficiency in existing Berkeley residences. This long-standing goal contributes to the Berkeley Climate Action goal of reducing Berkeley's overall greenhouse gas emissions by 80% by the year 2050.
- **When does RECO apply?** RECO applies to all homes, residential areas of mixed-use buildings, tenants-in-common, condominiums, multi-family properties, live-work spaces and boarding houses
- **Renovation:** All homes or apartment buildings undergoing renovations with a combined permit value of \$50,000 or more **must** demonstrate compliance with RECO requirements
- **Sale or Transfer of Property:** All homes or apartment buildings, sold or transferred **must** demonstrate compliance with RECO requirements by being inspected and filing "Form A - Certificate of RECO Compliance" with the City of Berkeley.

# BUILD IT GREEN



2007 Edition

## HOME REMODELING GREEN BUILDING GUIDELINES



# BUILD IT GREEN

## REMODELING

### 2007 Home Remodeling GreenPoints Checklist

Page 2

The green building practices listed below are described in the Home Remodeling Green Building Guidelines, available at [www.BuildItGreen.com](http://www.BuildItGreen.com)

	Community	Energy	IAQ/Health	Resources	Water
<b>D. STRUCTURAL FRAME &amp; BUILDING ENVELOPE</b>					
<b>1. Apply Optimal Value Engineering</b>					
a. Place Rafters and Studs at 24-inch On Center Framing					
b. Size Rafters and Studs to Meet Design Load					
<b>4. Use Solid Wall Systems (includes core, joist, &amp; any non-back frame assembly)</b>					
a. Floors					
b. Walls					
c. Roofs					
<b>5. Reduce Pollution Entering the Home from the Garage</b>					
a. Tightly Seal the Air Barrier between Garage and Living Area					
b. Install Garage Exhaust Fan OR Build a Detached Garage					
<b>6. Design Energy Heels on Roof Trusses</b>					
<b>7. Install Overhangs and Gutters</b>					
<b>8. Install Reflective Roof and Radiant Barrier</b>					
<del>9. Replace Single-Pane Windows with High Performance Windows (U-factor <math>\leq 0.40</math> &amp; SHGC <math>\leq 0.40</math>)</del>					
10. Retrofit with Storm Windows					
11. Install Low-SHGC Window Film on Single-Pane Windows					
12. Retrofit Structure for Earthquakes					
<b>E. EXTERIOR FINISH</b>					
<b>1. Use Recycled-Content (No Virgin Plastic) or FSC-Certified Decking</b>					
<b>2. Install Rain Screen Wall System</b>					
<b>3. Use Durable and Noncombustible Siding Materials</b>					
<b>4. Use Durable and Noncombustible Roofing Materials</b>					
<b>F. INSULATION</b>					
<b>1. Install Insulation with 75% Recycled Content</b>					
a. Walls and/or Floors					
b. Ceilings					
<b>2. Install Insulation that is Low-Emitting (Certified Section 01350)</b>					
a. Walls and Floors					



# BUILD IT GREEN

## REMODELING

### 2007 Home Remodeling GreenPoints Checklist

Page 4

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	Community	Energy	IAQ/Health	Resources	Water
c. Install Kitchen Range Hood Vented to the Outside					
<b>9. Install Mechanical Ventilation System for Cooling</b>					
a. Install ENERGY STAR Ceiling Fans & Light Kits in Living Areas & Bedrooms					
b. Install Whole House Fan with Variable Speeds					
<b>10. Install Mechanical Ventilation for Fresh Air</b>					
a. Install Air-to-Air Heat Exchanger (Heat or Energy Recovery Ventilator)					
<b>11. Install Carbon Monoxide Alarm(s)</b>					
<b>I. RENEWABLE ENERGY</b>					
<b>1. Install Solar Water Heating System</b>					
<b>2. Install Photovoltaic (PV) System that offsets electric energy use by:</b>					
a. .30% of electric needs OR 1.2 kw					
b. 60% of electric needs OR 2.4 kw					
c. 90% of electric needs OR 3.6 kw					
<b>J. BUILDING PERFORMANCE</b>					
<b>1. Whole House Inspection/Diagnostic Testing &amp; Improvements Made</b>					
a. Duct Testing and Improvements Made so that Leakage is < 15%					
b. Blower Door Testing and Improvements Made so that Air Change per hour is < 0.35					
c. House Passes Combustion Safety Backdraft Test					
<b>K. FINISHES</b>					
<b>1. Design Entryways to Reduce Tracked in Contaminants</b>					
<b>2. Use Low/No-VOC Paint</b>					
a. Low-VOC Interior Wall/Ceiling Paints (Flat <50 g/L VOC; Non-Flat <150 g/L VOC)					
b. Zero-VOC: Interior Wall/Ceiling Paints (<5 g/L VOC)					
<b>3. Use Low VOC, Water-Based Wood Finishes (&lt;250 g/L VOC)</b>					
<b>4. Use Low-VOC Caulks &amp; Construction Adhesives (&lt;70 g/L VOC for All Adhesives)</b>					
<b>5. Use Recycled-Content Paint</b>					
<b>6. Use Environmentally Preferable Materials for Interior Finish: A) FSC Certified Wood, B) Reclaimed Materials, C) Rapidly Renewable D) Recycled-Content or E) Finger-Jointed</b>					
a. Cabinets (50% Minimum)					
b. Interior Trim (50% Minimum)					
c. Shelving (50% Minimum)					
d. Doors (50% Minimum)					
e. Countertops (50% Minimum)					
<b>7. Reduce Formaldehyde in Interior Finish (CA Section 01350)</b>					
a. Subfloor (50% Minimum)					
b. Cabinets (50% Minimum)					
c. Interior Trim (50% Minimum)					
d. Shelving(50% Minimum)					
<b>8. After Installation of Finishes, Test of Indoor Air Shows Formaldehyde Level &lt;27 ppb</b>					
<b>L. FLOORING</b>					

# BUILD IT GREEN

## GreenPoint Rated Existing Home Energy Vintage Thresholds

A home qualifying for the Whole House label must meet or beat the Energy Budget based on a Vintage Threshold for its age.

	Pre-1980	1980 - 2000	2001 - 2005	2005 +
Conditioned Floor Area	Actual	Actual		
Single or Two Story	Actual	Actual		
Floor (Raised Floor or Slab)	Actual	Actual		
Average Ceiling Height	Actual	Actual		
<b>Insulation</b>				
Roof/Attic	R-30 / R-38 <sup>1</sup>	R-30 / R-38 <sup>1</sup>		
Walls	Actual	R-13		
Raised Floors	R-19	R-19		
Slab	Actual	Actual		
<b>Glazing</b>				
Percentage (floor area)	Actual	Actual		
U-Factor	0.99	0.79		
SHGC	0.74	0.70		
<b>HVAC</b>				
<b>Heating</b>				
Gas (AFUE)	0.90	0.90		
Electric (HSPF)	8.8	8.8		
<b>Cooling (if any)</b>				
SEER	14.0	14.0		
EER	11.5	11.5		
<b>Ducts (if ducted system)</b>				
Insulation	R-6 or 8 <sup>2</sup>	R-6 or 8 <sup>2</sup>		
Leakage (% airflow)	15%	15%		
Water Heating	Actual	Actual		
Infiltration (ACH)	0.5	0.5		
<b>Other Conservation Features</b>				
Thermostat	Programmable	Programmable		

10% Better than House with 2001 Prescriptive Package Measures

10% Better than House with 2005 Prescriptive Package Measures

## GreenPoint Rated for Existing Homes

### Performance method

37% energy efficiency upgrade over pre-1980 existing conditions to qualify for the GreenPoint Rated Whole House Label

1. Attic Insulation: R-30 Climate Zones 2 - 10, R-38 Climate Zones 1, 11-16

2. Duct Insulation: R-6 Climate Zones 2 - 10, R-8 Climate Zones 1, 11-16

# BUILD IT GREEN

## GreenPoint Rated

j) Windows Upgraded to Current Code Requirements, Which are Typically Dual Pane

## Prescriptive method

Window upgrades are placed in building Performance as part of the envelope performance. Places windows in the context of overall envelope performance where it belongs.

Project Name	Points Achieved	Community	Energy	Indoor Air Quality	Resource	Water
<b>J. BUILDING PERFORMANCE</b>						
<b>Possible Points</b>						
1. Energy Survey and Education (Includes blower door test) (Required for Elements or Meet J3a)			R			
2. Energy Upgrade (Available for Elements Rating Only, Mutually exclusive with J3a. Two points minimum for credit, maximum 6 points)			R			
TIER 1: Practices in Tier 1 Are Worth Full Value (1 point)						
a) Attic Insulation up to or Exceeding Current Code			1			
b) Crawl Space Insulation up to or Exceeding Current Code			1			
c) Wall Insulation up to or Exceeding Current Code			1			
d) High Efficiency Furnace (50% AFUE Minimum)			1			
e) Seal Ducts and Duct Leakage Is <15%			1			
f) 14 SEER, 11.5 EER Air Conditioning Unit (In climate zones 2,4,8-15)			1			
g) House Passes Blower Door Test With <0.5 ACH or a 50% Improvement			1			
Total Points Available in Building Performance = 31+						
<b>K. FINISHES</b>						
<b>Possible Points</b>						
1. Entryways Designed to Reduce Tracked in Contaminants			1			
2. Low/No-VOC Paint						
a. Low-VOC Interior Wall/Ceiling Paints (<50 gpl VOCs regardless of sheen)				1		
b. Zero-VOC Interior Wall/Ceiling Paints (<5 gpl VOCs (flat))				2		
3. Coatings Meet SCAQMD Rule 1113 for Low VOCs				2		
4. Low-VOC Caulks & Construction Adhesives (Meet SCAQMD Rule 1168)				2		
5. Recycled-Content Paint					1	
6. Environmentally Preferable Materials for Interior Finish: A) FSC Certified Wood B) Reclaimed Materials C) Rapidly Renewable D) Recycled-Content E) Finger-Jointed or F) Local						
a. Cabinets					1	
b. Interior Trim					1	
c. Shelving					1	
d. Doors					1	
e. Countertops					1	
7. Formaldehyde Reduced in Interior Finish (CA Section 01350)						
a. Subfloor & Stair Treads				1		
b. Cabinets & Countertops				1		
c. Interior Trim				1		
d. Shelving				1		
8. After Installation of Finishes, Test of Indoor Air Shows Formaldehyde Level <27ppb					3	
Total Points Available in Finishes = 22						
<b>L. FLOORING</b>						
<b>Possible Points</b>						
1. Environmentally Preferable Flooring: A) FSC-Certified Wood B) Reclaimed or Refinished C) Rapidly Renewable D) Recycled-Content, E) Exposed Concrete F) Local Flooring Adhesives Must Have <70 gpl VOCs and sealer must meet SCAQMD Rule 1113.					4	
2. Thermal Mass Floors			1			
3. Flooring Meets CA Section 01350 or CRI Green Label Plus Requirements				2		
Total Points Available in Flooring = 7						

# Green Building Climate Calculator

Available at [http://stopwaste.org/docs/173915182008gpr\\_climate\\_calculator\\_report\\_june\\_2008.pdf](http://stopwaste.org/docs/173915182008gpr_climate_calculator_report_june_2008.pdf)

## The GreenPoint Rated Climate Calculator

June 2008



# Green Building Climate Calculator

## The GreenPoint Rated Climate Calculator

June 2008



“Green remodeling reduces net CO<sub>2</sub>e emissions, while constructing new homes (whether green or conventional) increases net CO<sub>2</sub>e emissions. Given that 70% of homes in the state were built before 1980, the opportunity for true emissions reduction is enormous in the home remodeling sector.”

# Green Building Climate Calculator

## The GreenPoint Rated Climate Calculator

June 2008

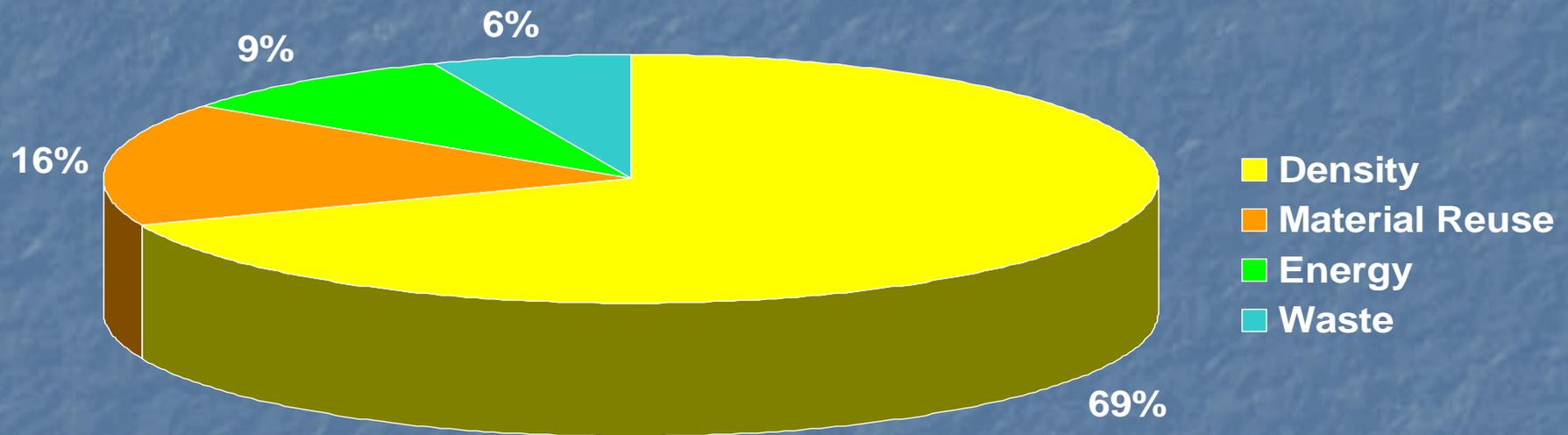


“Green remodeling reduces net CO<sub>2</sub>e emissions, while constructing new homes (whether green or conventional) increases net CO<sub>2</sub>e emissions. Given that 70% of homes in the state were built before 1980, the opportunity for true emissions reduction is enormous in the home remodeling sector.”

“But even though more savings per home are available to the new home sector, total emissions actually increase with each new home. When a new home is built that doesn't replace an existing building, there is inevitably a net increase in GHG emissions because the construction has added another building to the state's building stock.”

# Green Building Climate Calculator

## Impact of selected parameters on CO<sup>2</sup> emissions



# Green Code Overview Title 24 Part 11

## ■ occupancy

- State buildings
- UC, CSU, & CCC
- Existing State-owned Buildings
- Unreinforced masonry Bearing Wall Buildings
- Hotels, Motels, Lodging
- Apartments, condominiums
- Dwellings
- Shelters
- Factory built housing
- Public elementary schools
- Public secondary schools
- Community colleges
- Acute care hospitals
- Acute psychiatric hospitals
- Skilled nursing facilities
- Intermediate care facilities
- Qualified Historical Buildings, structures and sites

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## ■ agency

BSC

## ■ section

103

# Green Code Overview Title 24 Part 11

■ occupancy                      ■ agency                      ■ section

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BSC

103

HCD

104

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## ■ agency

BSC

HCD

DSA

OSHDPD

## ■ section

103

104

105

106

# Green Code Overview Title 24 Part 11

■ occupancy	■ agency	■ section
<ul style="list-style-type: none"><li>■ State buildings</li><li>■ UC, CSU, &amp; CCC</li><li>■ Existing State-owned Buildings</li><li>■ Unreinforced masonry Bearing Wall Buildings</li><li>■ Hotels, Motels, Lodging</li><li>■ Apartments, condominiums</li><li>■ Dwellings</li><li>■ Shelters</li><li>■ Factory built housing</li><li>■ Public elementary schools</li><li>■ Public secondary schools</li><li>■ Community colleges</li><li>■ Acute care hospitals</li><li>■ Acute psychiatric hospitals</li><li>■ Skilled nursing facilities</li><li>■ Intermediate care facilities</li><li>■ Qualified Historical Buildings, structures and sites</li></ul>	BSC	103
	HCD	104
	DSA	105
	OSHPPD	106
	SHBSB	reserved

# Green Code Overview Title 24 Part 11

## ■ Application Matrix

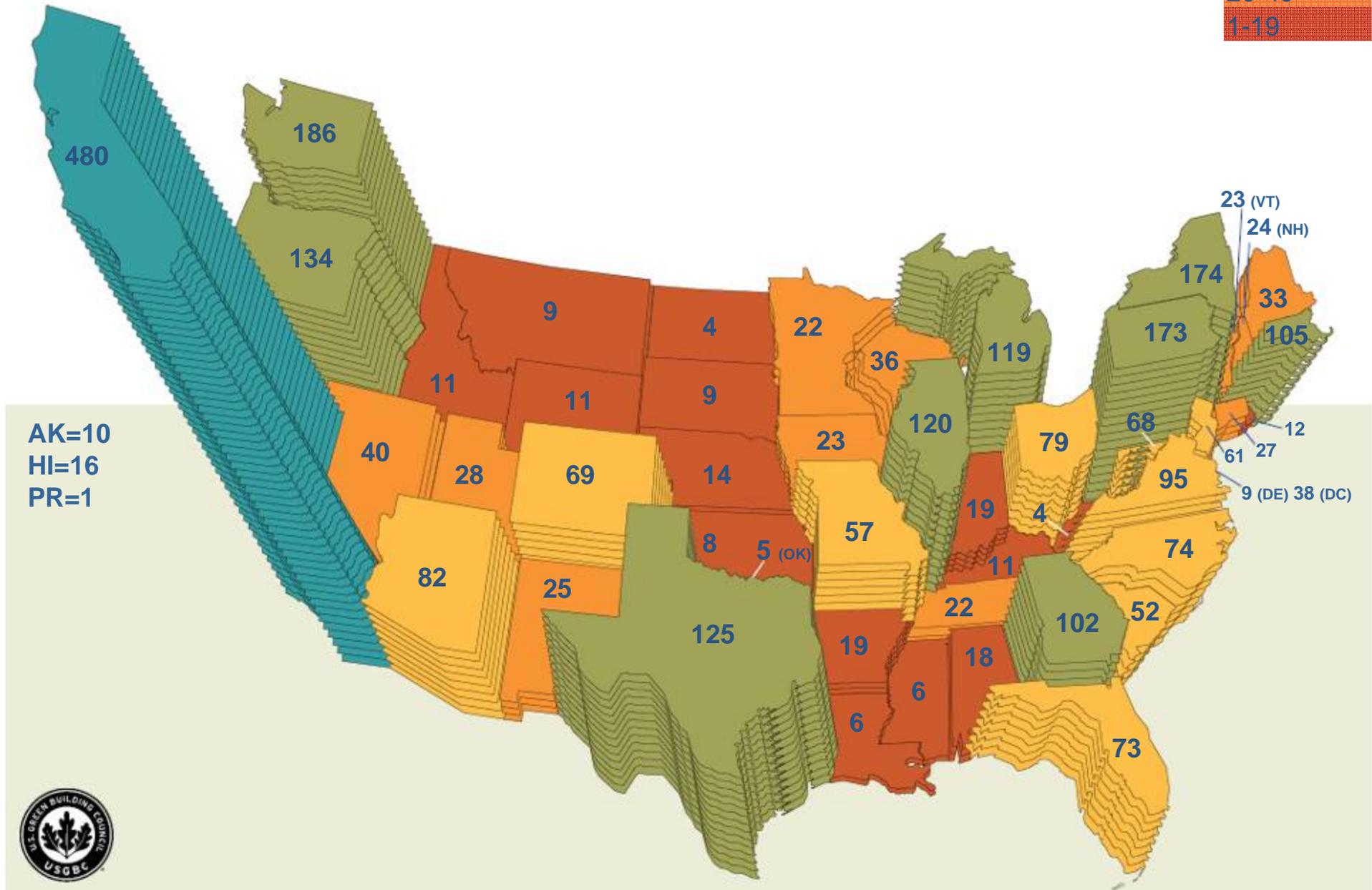
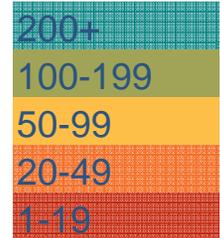
### BSC

- Required measures from the Application Matrix (7% of all measures):
  - 512.1.1 Elevator controls that reduce energy demand
  - 604.1 Water budget developed for landscape irrigation
  - 707.1 Provide weather-resistant exterior wall envelope
  - 710.1 Recycling by occupants
  - 804.4.1 Adhesives and primers shall comply with CCR requirements
  - 804.4.4 Composite wood products shall limit formaldehyde content as per Tables
  - 804.6.1 Install HVAC, refrigeration and fire suppression without CFCs
  - 806.1 Mechanically or naturally ventilate spaces compliant with CCR

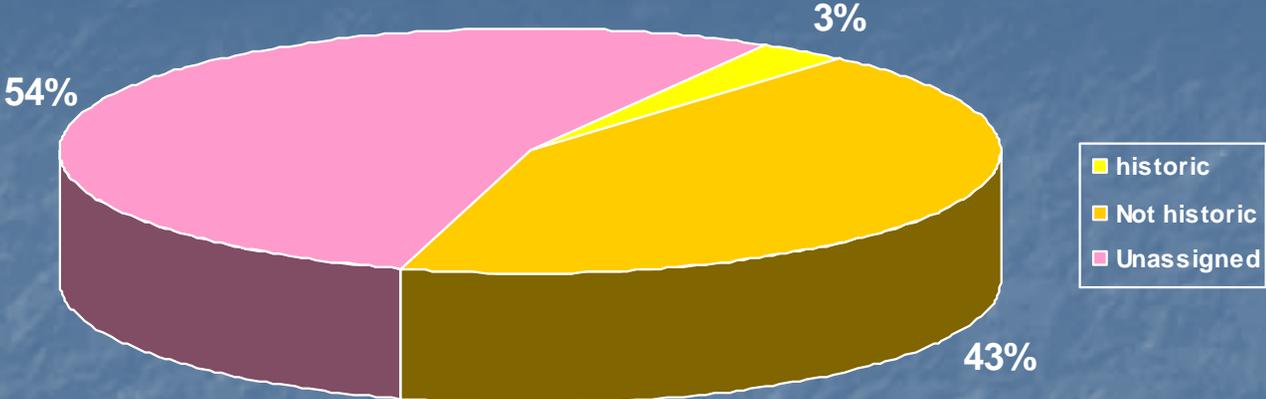
# LEED for new construction projects

07/06

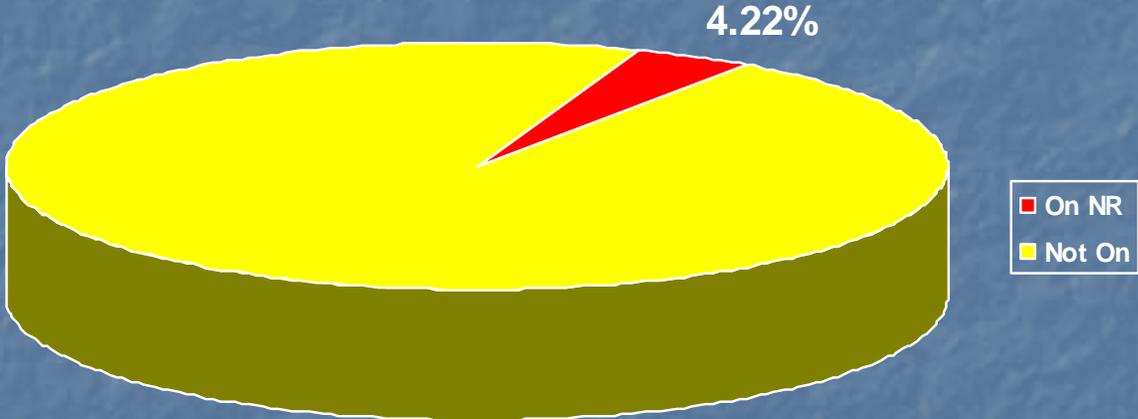
Distribution  
by geography



# LEED Historic Projects Nationally



LEED historic sites



95.78%  
LEED historic sites on N.R.

Source: USGBC LEED Project List – PUBLIC (2-1-08).xlsx (self reporting form)

# LEED NC V3 2009

## LEED V2.2



**LEED-NC**  
LEED-NC 2.2 Submittal Template

**WE Credit 2: Innovative Wastewater Technologies** **design**

(Responsible Individual)  from (Company Name)

verify that the information provided below is accurate, to the best of my knowledge.

**SELECT OPTION**  
Please select the appropriate option to determine innovative wastewater technologies (this will activate the remainder of the submittal form)

Option 1: Water Savings Calculation

Option 2: On-Site Wastewater Treatment

**GENERAL PROJECT INFORMATION**  
Please enter the following general project information for either Option 1 or Option 2:

Use Default Male / Female Occupancy Breakdown (50% / 50%).  
ENTER THE TOTAL OCCUPANCY FOR EACH OCCUPANCY TYPE IN TABLE 1.01 BELOW

Special Male/Female Occupancy Breakdown  
ENTER THE MALE AND FEMALE OCCUPANCY FOR EACH OCCUPANCY TYPE IN TABLE 1.02 BELOW. PROVIDE A NARRATIVE DESCRIPTION AT THE END OF THIS FORM TO EXPLAIN THE UNIQUE MALE/FEMALE OCCUPANCY BREAKDOWN.

**Table 1.01 - Occupancy Breakdown (Default Male / Female Occupancy)**  
Enter the values as whole numbers without any commas

	Full Time Equivalent (FTE):	Student/Visitor:	Retail Customer:	Residential:	Other:
Total					
Male					
Female					

**Table 1.02 - Occupancy Breakdown (Special Male / Female Occupancy Breakdown)**  
Enter the values as whole numbers without any commas

	Full Time Equivalent (FTE):	Student/Visitor:	Retail Customer:	Residential:	Other:
Total	351				
Male	214				
Female	137				

Percent of male restrooms with urinals:  % Annual Days of Operation (1-365):

Powered by **Adobe LiveCycle** LEED-NC 2.2 Submittal Template | Last Modified: April, 2006



# LEED NC V3 2009



<u>Division</u>	<u>V2.2</u>	<u>V3</u>	<u>Net % Change</u>
Sustainable Sites (SS)	14 (20.3%)	26 (26%)	+5.7%
Water Efficiency (WE)	05 (7.3%)	10 (10%)	+2.7%
Energy & Atmosphere (EA)	17 (24.6%)	35 (35%)	+10.4%
Materials & Resources (MR)	13 (18.8%)	14 (14%)	-4.8%
Indoor Environmental Quality (EQ)	15 (21.7%)	15 (15%)	-6.7%
Innovation & Design (ID)	05 (7.3%)	-- (bonus)	
Total:	69	100	
<b>Bonus Credits:</b>			
Innovation & Design (ID)		06	
Regional Credits		<u>04</u>	
Total:		110	

Bonus credits do not count toward certification.

<u>Certification Threshold Increase:</u>	<u>V2.2</u>	<u>V3</u>
Certified	26-32	40-49
Silver	33-38	50-59
Gold	39-51	60-79
Platinum	52-69	80-100

# LEED NC V3 2009



## **Sustainable Sites Credit 2 Development Density and Community Connectivity**

Increased from 1 to 5 points. This reflects the importance that density contributes towards energy conservation.

Overall Sustainable sites increased from 14 to 26 points, which increases the division's overall profile by 5.7%

# LEED NC V3 2009



## Energy and Atmosphere Credit 2

### On-site Renewable Energy

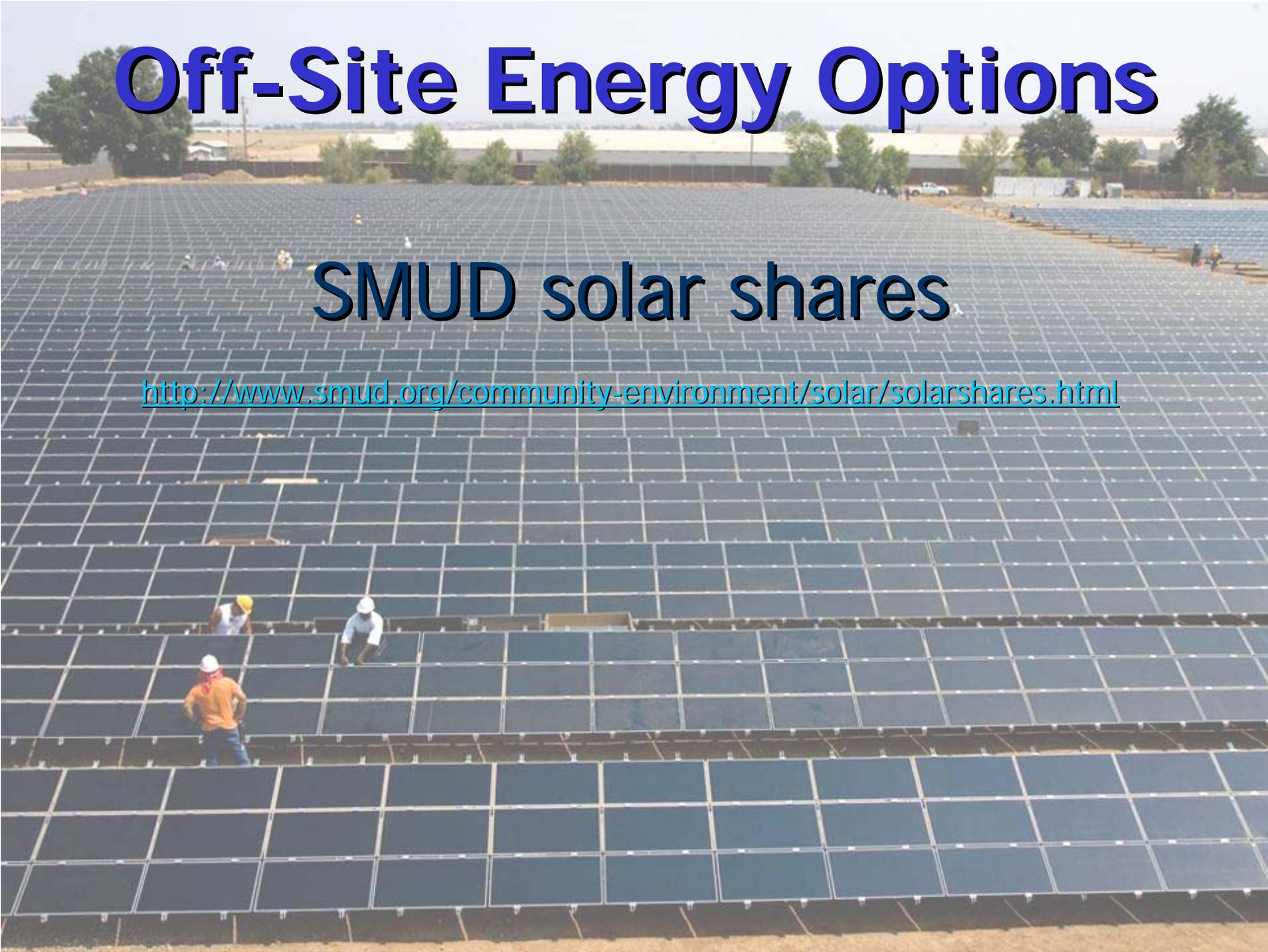
On site renewable energy increases from 1 point to 3 points.

## Energy and Atmosphere Credit 6

### Green Power

Off site renewable energy certificates increase from 1 point to 2 points.

# Off-Site Energy Options

A wide-angle photograph of a large-scale solar farm under construction. The foreground and middle ground are filled with rows of solar panels mounted on metal frames. Several workers wearing hard hats and safety vests are visible, working on the panels. In the background, there are trees, a fence, and some industrial buildings under a clear sky.

## SMUD solar shares

<http://www.smud.org/community-environment/solar/solarshares.html>

# LEED NC V3 2009



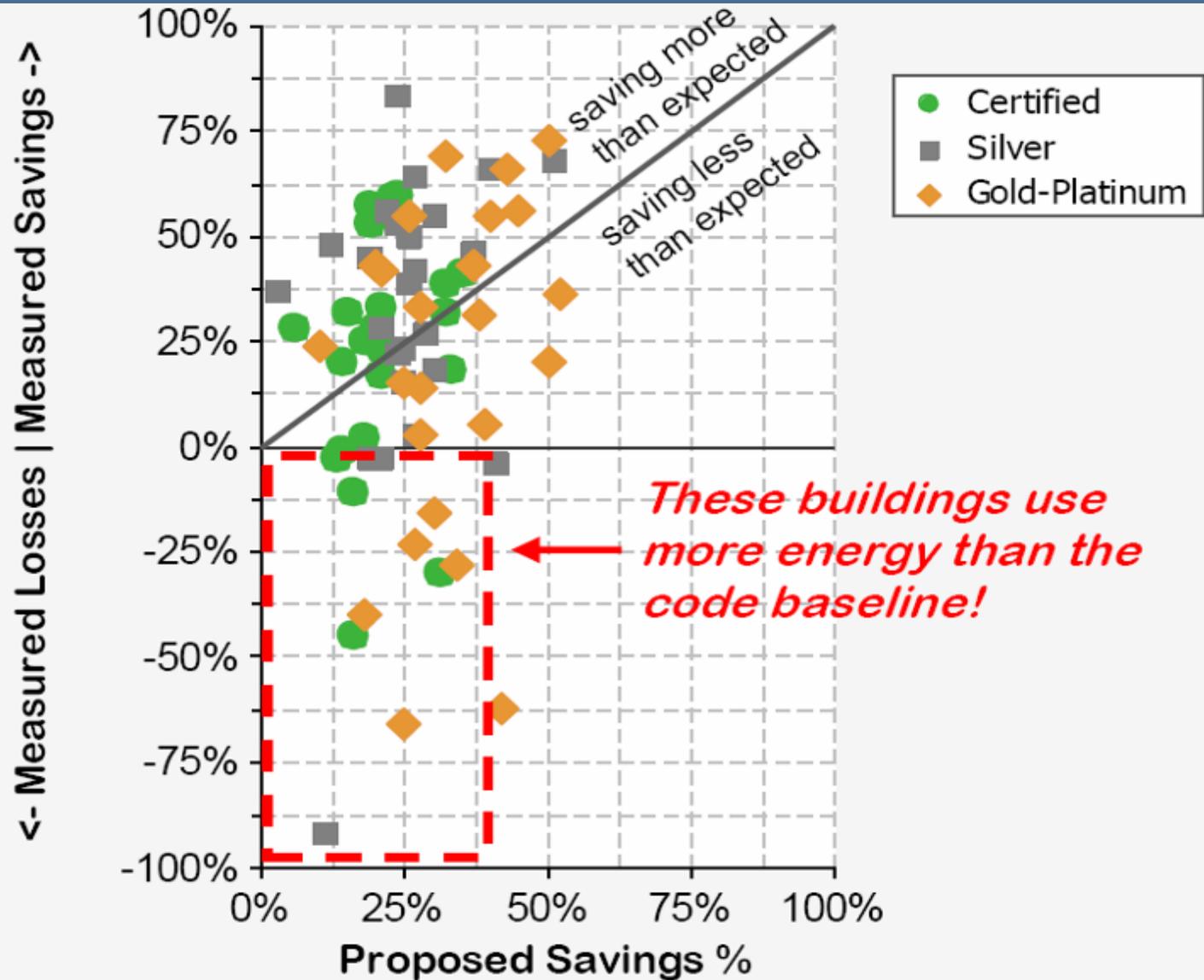
## **Materials and Resources Credit 2.1 Building Reuse: Maintain 75% of existing wall, floors and roof**

Points increase from 1 to 2. The overall influence of Materials and Resources is diminished with the larger point increases in other categories.

# Energy Performance of LEED® for New Construction Buildings



FINAL REPORT  
March 4, 2008



# LEED EB

## LEED for Existing Buildings: Operations & Maintenance - as compared to LEED for Existing Buildings v2.0

created May 2008

15 50 21

Possible Points 92

2 9 1 Sustainable Sites				Possible Points 12		
Score	CR	Mid	New			
				CR#1	LEED Certified Design and Construction	1
				CR#2	Building Exterior and Hardscape Management Plan	1
				CR#3	Integrated Pest Management, Erosion Control, and Landscape Management Plan	1
				CR#4.1	Alternative Commuting Transportation - 10% Reduction	1
				CR#4.2	Alternative Commuting Transportation - 25% Reduction	1
				CR#4.3	Alternative Commuting Transportation - 50% Reduction	1
				CR#4.4	Alternative Commuting Transportation - 75% Reduction or greater	1
				CR#5	Reduced Site Disturbance - Protect or Restore Open Space	1
				CR#6	Stormwater Management	1
				CR#7.1	Heat Island Reduction - Non-Roof	1
				CR#7.2	Heat Island Reduction - Roof	1
				CR#8	Light Pollution Reduction	1

10 4 Materials & Resources				Possible Points 14		
Score	CR	Mid	New			
				PR#1	Sustainable Purchasing Policy	R
				PR#2	Solid Waste Management Policy	R
				CR#1.1	Sustainable Purchasing - Ongoing Consumables, 40%	1
				CR#1.2	Sustainable Purchasing - Ongoing Consumables, 60%	1
				CR#1.3	Sustainable Purchasing - Ongoing Consumables, 80%	1
				CR#2.1	Sustainable Purchasing - Durable Goods, electric-powered equipment	1
				CR#2.2	Sustainable Purchasing - Durable Goods, furniture	1
				CR#3	Sustainable Purchasing - Facility Alterations and Additions	1
				CR#4.1	Sustainable Purchasing - Reduced Mercury in Lamps 90 ppb/yr-hr	1
				CR#4.2	Sustainable Purchasing - Reduced Mercury in Lamps 70 ppb/yr-hr	1
				CR#5	Sustainable Purchasing - Food	1
				CR#6	Solid Waste Management - Waste Stream Audit	1
				CR#7.1	Solid Waste Management - Ongoing Consumables, 50%	1
				CR#7.2	Solid Waste Management - Ongoing Consumables, 70%	1
				CR#8	Solid Waste Management - Durable Goods	1
				CR#9	Solid Waste Management - Facility Alterations and Additions	1

2 2 6 Water Efficiency				Possible Points 10		
Score	CR	Mid	New			
				PR#1	Minimum Indoor Plumbing Fixture and Fitting Efficiency	R
				CR#1.1	Water Performance Measurement - Whole Building Metering	1
				CR#1.2	Water Performance Measurement - Submetering	1
				CR#2.1	Additional Indoor Plumbing Fixture and Fitting Efficiency - 10%	1
				CR#2.2	Additional Indoor Plumbing Fixture and Fitting Efficiency - 20%	1
				CR#2.3	Additional Indoor Plumbing Fixture and Fitting Efficiency - 30%	1
				CR#3.1	Water Efficient Landscaping - Reduce Potable Water Use by 50%	1
				CR#3.2	Water Efficient Landscaping - Reduce Potable Water Use by 75%	1
				CR#3.3	Water Efficient Landscaping - Reduce Potable Water Use by 100%	1
				CR#4.1	Cooling Tower Water Management - Chemical Management	1
				CR#4.2	Cooling Tower Water Management - Non-Potable Water Source Use	1

1 8 8 3 Indoor Environmental Quality				Possible Points 19		
Score	CR	Mid	New			
				PR#1	Outdoor Air Introduction and Exhaust Systems	R
				PR#2	Environmental Tobacco Smoke (ETS) Control	R
				PR#3	Green Cleaning Policy	R
				CR#1.1	IAQ Best Management Practices - IAQ Management Plan	1
				CR#1.2	IAQ Best Management Practices - Outdoor Air Delivery Monitoring	1
				CR#1.3	IAQ Best Management Practices - Increased Ventilation	1
				CR#1.4	IAQ Best Management Practices - Reduce Particulates in Air Distribution	1
				CR#1.5	IAQ Best Management Practices - Management for Facility Alterations and Additions	1
				CR#2.1	Occupant Comfort - Occupant Survey	1
				CR#2.2	Occupant Comfort - Occupant Controlled Lighting	1
				CR#2.3	Occupant Comfort - Thermal Comfort Monitoring	1
				CR#2.4	Occupant Comfort - Daylight and Views, 50% Daylight / 45% Views	1
				CR#2.5	Occupant Comfort - Daylight and Views, 75% Daylight / 50% Views	1
				CR#3.1	Green Cleaning - High Performance Cleaning Program	1
				CR#3.2	Green Cleaning - Custodial Effectiveness Assessment, < 3	1

23 7 Energy & Atmosphere				Possible Points 30		
Score	CR	Mid	New			
				PR#1	Energy Efficiency Best Management Practices	R
				PR#2	Minimum Energy Efficiency Performance	R
				PR#3	Refrigerant Management - Ozone Protection	R
				CR#1	Optimize Energy Performance	15
				CR#2.1	Existing Building Commissioning - Investigation and Analysis	2

				CR#3.0	Performance measurement - System Energy Intensity - 00/70	1
				Credit 4.1	Renewable Energy - On-site 3% / Off-site 25%	1
				Credit 4.2	Renewable Energy - On-site 6% / Off-site 50%	1
				Credit 4.3	Renewable Energy - On-site 9% / Off-site 75%	1
				Credit 4.4	Renewable Energy - On-site 12% / Off-site 100%	1
				Credit 5	Refrigerant Management	2
						Possible Points 7

# LEED ND

## **NPD credit 1 - walkable streets**

- **Projects in designated historic districts, or are listed or eligible for listing in a state or national register, are exempt from credit guidelines.**

## **•GIB credit 4 – Existing Buildings and Reuse**

## **•GIB credit 5 – Historic Building Preservation and Reuse**

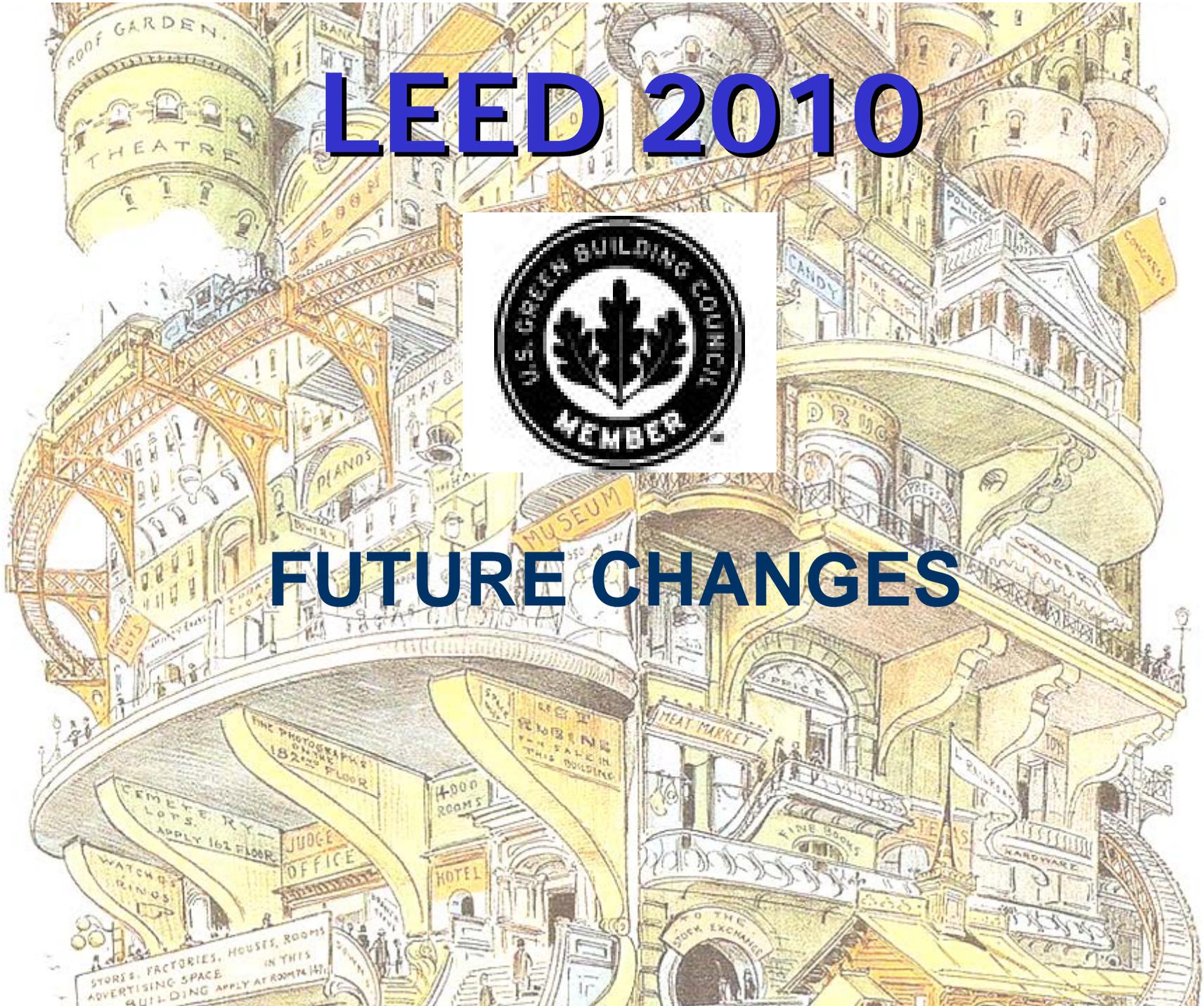
- **Prerequisite states NO points for credits 4 or 5 if a historic building is partially or completely demolished**

- **One point for each credit if historic building is retained**

# LEED 2010



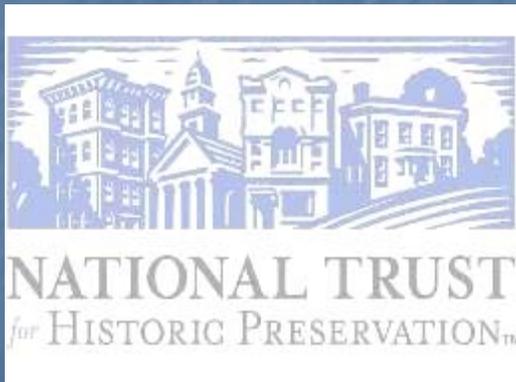
# FUTURE CHANGES

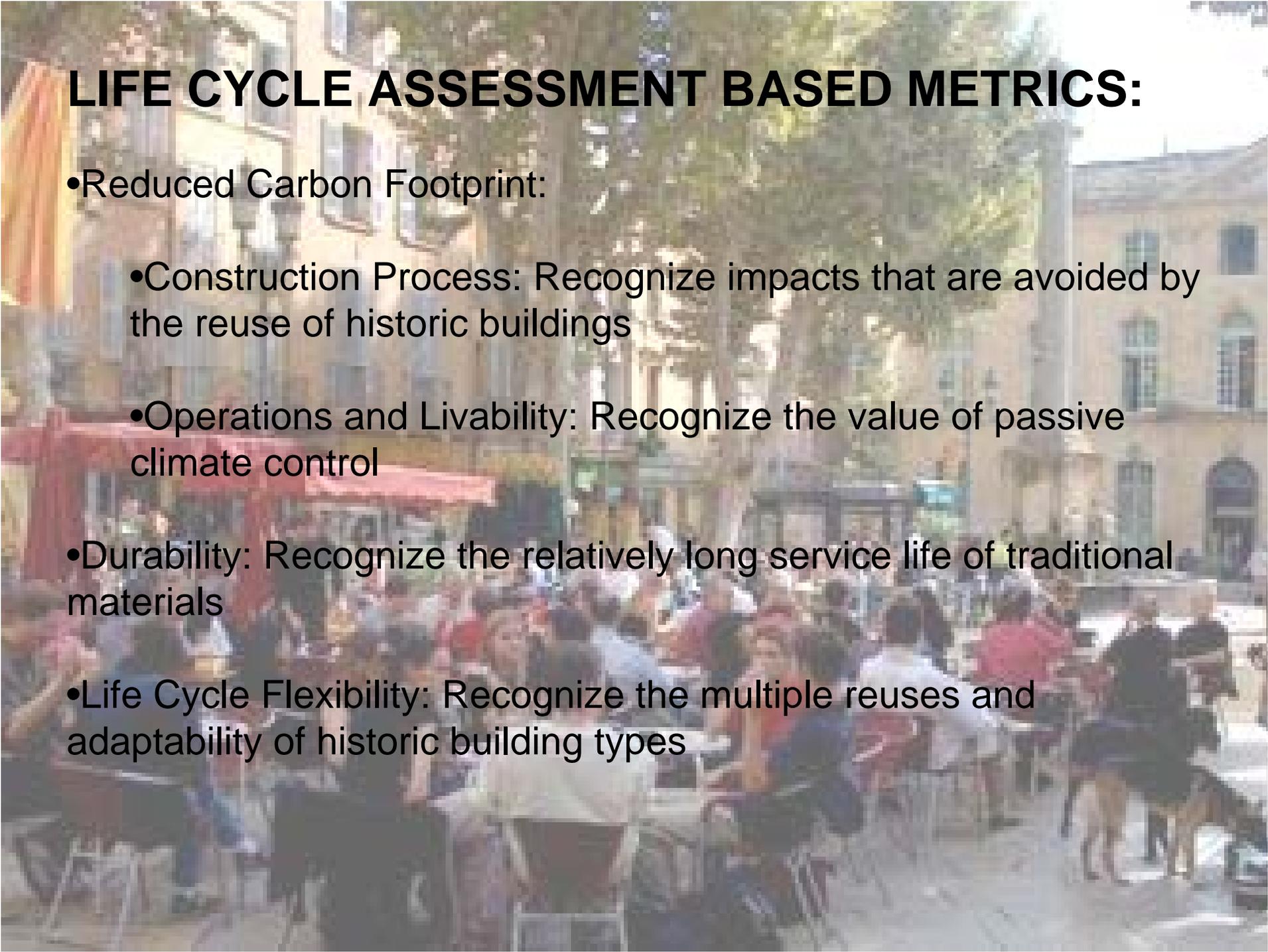


# Sustainable Preservation Coalition

## Partnering with USGBC

- Working together on integration of preservation values into revised versions of LEED.





## LIFE CYCLE ASSESSMENT BASED METRICS:

- Reduced Carbon Footprint:
  - Construction Process: Recognize impacts that are avoided by the reuse of historic buildings
  - Operations and Livability: Recognize the value of passive climate control
- Durability: Recognize the relatively long service life of traditional materials
- Life Cycle Flexibility: Recognize the multiple reuses and adaptability of historic building types

## **NON-LIFE CYCLE ASSESSMENT BASED METRICS:**

- **Social Sustainability:** Celebrate existing buildings and provide reward recognized architectural, cultural and social significance
- **Health and Comfort:** Recognize the high degree of individual controllability in historic buildings
- **Social Capital:** Recognize the importance of “social capital” associated with historic buildings and neighborhoods.



# Case Study – Santa Cruz

## On-Site Energy Options



## Solar Rights Act

### California Government Code Section 65850.5:

**65850.5 (a)** states that it is the intent of the Legislature that local jurisdictions not adopt ordinances that create unreasonable barriers to the installation of solar energy systems, including, but not limited to, design review for **aesthetic purposes**, and not unreasonably restrict the ability of homeowners and agricultural and business concerns to install solar energy systems.

### Civil Code Section 714:

**714. (a)** ...reasonable restrictions on a solar energy system are those restrictions that do not significantly increase the cost of the system or significantly decrease its efficiency or specified performance, **or that allow for an alternative system of comparable cost, efficiency, and energy conservation benefits.**

**(e)** Whenever approval is required for the installation or use of a solar energy system, **the application for approval shall be processed and approved by the appropriate approving entity in the same manner as an application for approval of an architectural modification to the property**, and shall not be willfully avoided or delayed.

# OHP RESOURCES



Office of Historic Preservation  
CALIFORNIA STATE PARKS

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State Parks

OHP Home

Workshops

CEQA

CHRIS/IC

Sustainability

THPO

Landmarks

Newsletter



GREEN PRESERVATION  
IN THE NEWS



LEGISLATION, POLICIES,  
ORDINANCES



LIFE CYCLE COST  
ACCOUNTING



PRESERVATION CASE  
STUDIES



SOLAR RIGHTS ACT



SUSTAINABILITY  
INFORMATION  
RESOURCES



WINDOW REPAIR &  
RETROFIT: STUDIES &  
RESEARCH



## SUSTAINABILITY

### SUSTAINABILITY

The accepted definition of sustainability from the U.N. World Commission on Environment and Development's 1987 report, "Our Common Future" is that sustainability involves "meeting the needs of the present without compromising the ability of future generations to meet their own needs." The intersection of sustainable design and historic preservation would seem a natural alliance.

Older and historic buildings comprise more than half of the existing buildings in the United States. Retention and adaptive reuse of these buildings preserves the materials, embodied energy, and human capital already expended in their construction. The recycling of buildings is one of the most beneficial "green" practices, and stresses the importance and value of historic preservation in the overall promotion of sustainability.

OHP promotes energy and resource conservation in historic buildings and believes this can be accomplished responsibly without compromising the qualities that define their intrinsic historic

# OHP RESOURCES



Office of Historic Preservation  
CALIFORNIA STATE PARKS

Skip to

State Parks OHP Home Workshops CEO CHRIS/IC Sustainability THPO Landmarks Newsletter



## TRAINING and WORKSHOPS

[www.ohp.parks.ca.gov](http://www.ohp.parks.ca.gov)

### PRESENTATIONS FROM PAST WORKSHOPS

#### 2008 CALIFORNIA PRESERVATION FOUNDATION (CPF) CONFERENCE PRESENTATIONS

##### **RIVERSIDE COUNTY Cultural Resources Pro-Seminars & Orientation Classes**

Riverside County requires all professional-level archaeologists certifying reports submitted to the County of Riverside to be certified as having attended an orientation/professional topics training session once very two years. Sessions are open to those not seeking certification, space permitting. For more information, contact Julie Urias [jurias@rctlma.org](mailto:jurias@rctlma.org) or Leslie Mouriquand [lmouriqu@rctlma.org](mailto:lmouriqu@rctlma.org) or visit Riverside County's [Cultural Resource Review](#) website.

March 20, 2009 – Archaic Period Archaeology (Melinda Horne and Donn Grenda)(register by March 6, 2009)

