Preservation is Sustainability

Mark Huck, AIA, LEED AP

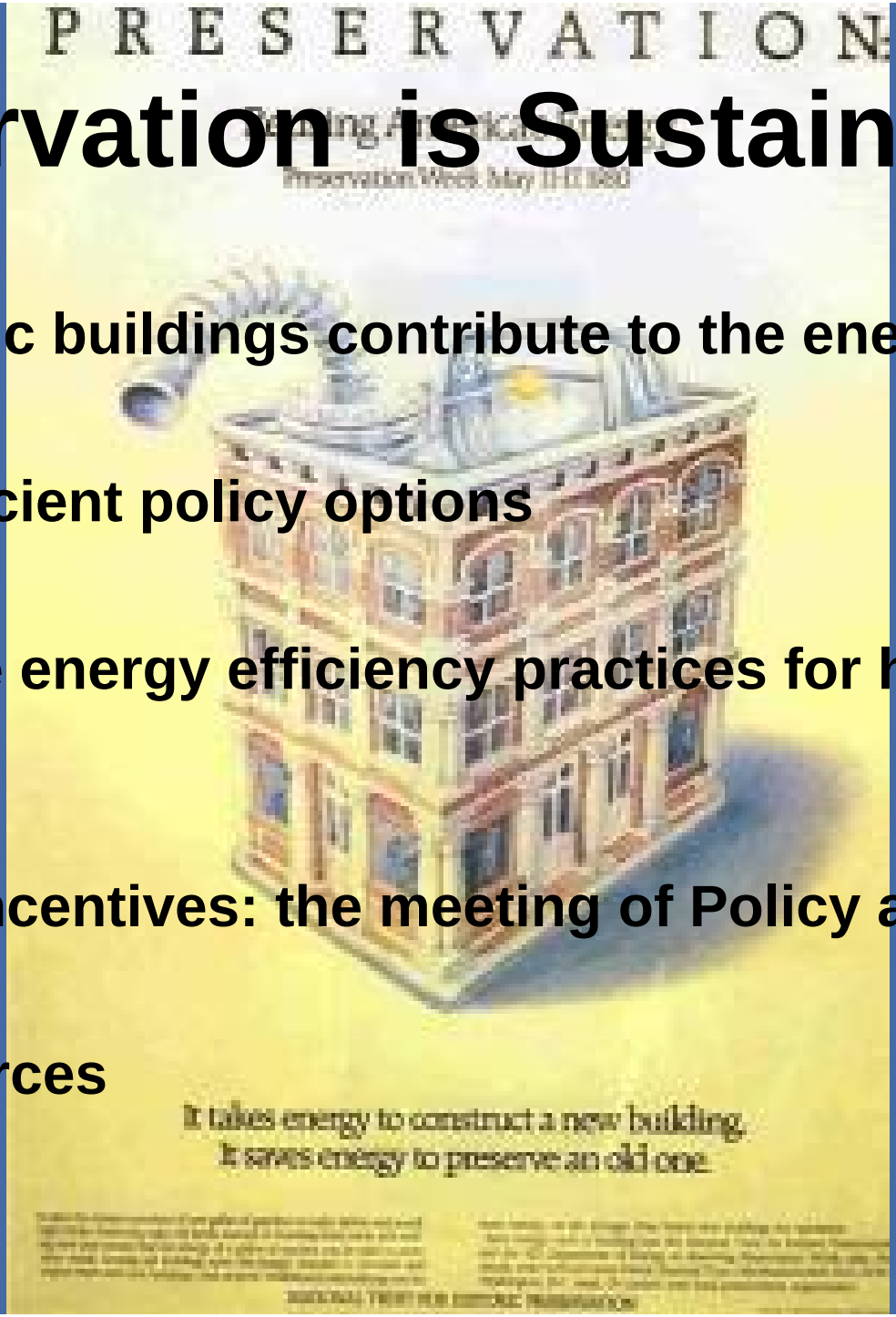
California Office of Historic Preservation

Keeping Time II

Columbia, California

June 19, 2009

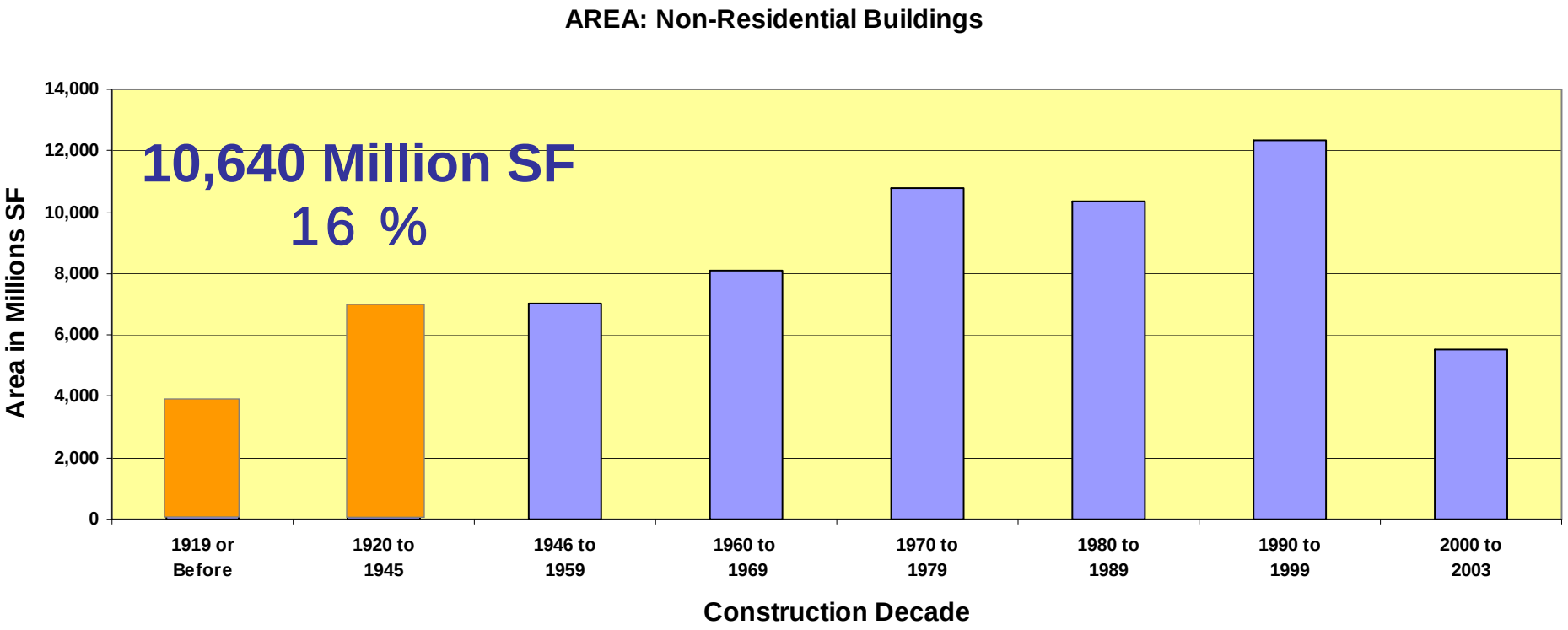
Preservation is Sustainability



- How historic buildings contribute to the energy solution
- Energy efficient policy options
- Compatible energy efficiency practices for historic resources
- Financial Incentives: the meeting of Policy and Practice
- OHP resources

HOW HISTORIC BUILDINGS CONTRIBUTE

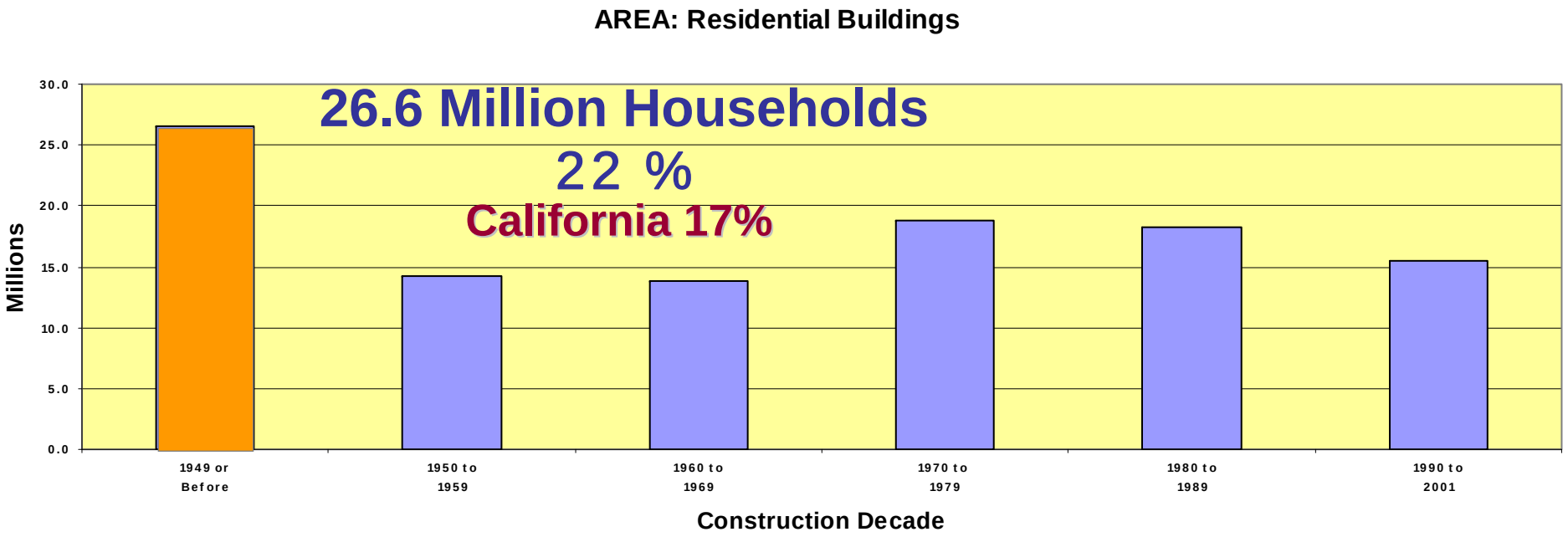
Historic Buildings Nationally



Commercial Building Inventory
Department of Energy

HOW HISTORIC BUILDINGS CONTRIBUTE

Historic Buildings Nationally



Residential Building Inventory

U.S.Census Bureau

HOW HISTORIC BUILDINGS CONTRIBUTE

Source: Commercial Building Energy Consumption Survey, 2003
http://www.eia.doe.gov/emeu/cbecs

Average energy consumption Btu/sq. ft
Commercial Buildings (non malls)

Before 1920	**80,127**
1920 – 1945	**90,234**
1946 – 1959	**80,198**
1960 – 1969	**90,976**
1970 – 1979	**94,968**
1980 – 1989	**100,077**
1990 – 1999	**88,834**
2000 – 2003	**79,703**

PERCEIVED ENERGY INEFFICIENCY

HOW HISTORIC BUILDINGS CONTRIBUTE

Source: Total Energy Consumption in US Households by Year of Construction
http://www.eia.doe.gov/emeu

Average annual energy consumption units/Household

Decade built	kWh	kcf (gas)
Before 1949	8,332	82
1950 – 1959	9,533	71
1960 – 1969	9,586	63
1970 – 1979	11,971	61
1980 – 1989	12,534	63
1990 – 2001	10,656	70

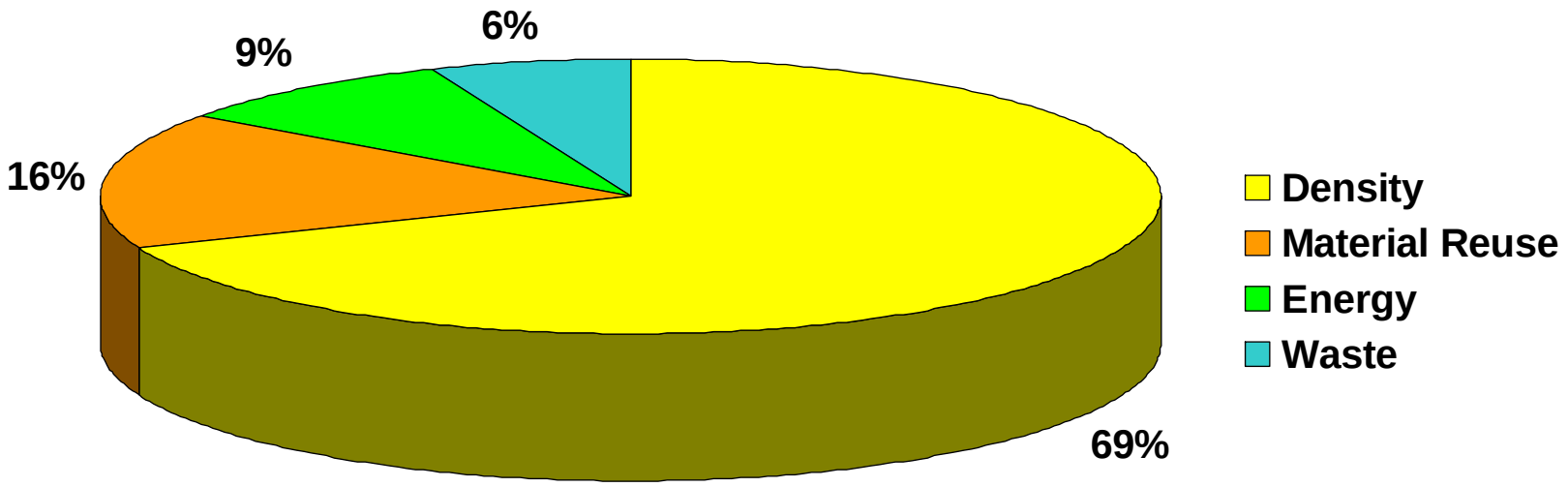
PERCEIVED ENERGY INEFFICIENCY

HOW HISTORIC BUILDINGS CONTRIBUTE:
ORIGINALLY EFFICIENT

Green Building Climate and Resource Calculator

Preliminary Impact of selected parameters on CO_2 contribution

Developed by StopWaste.org

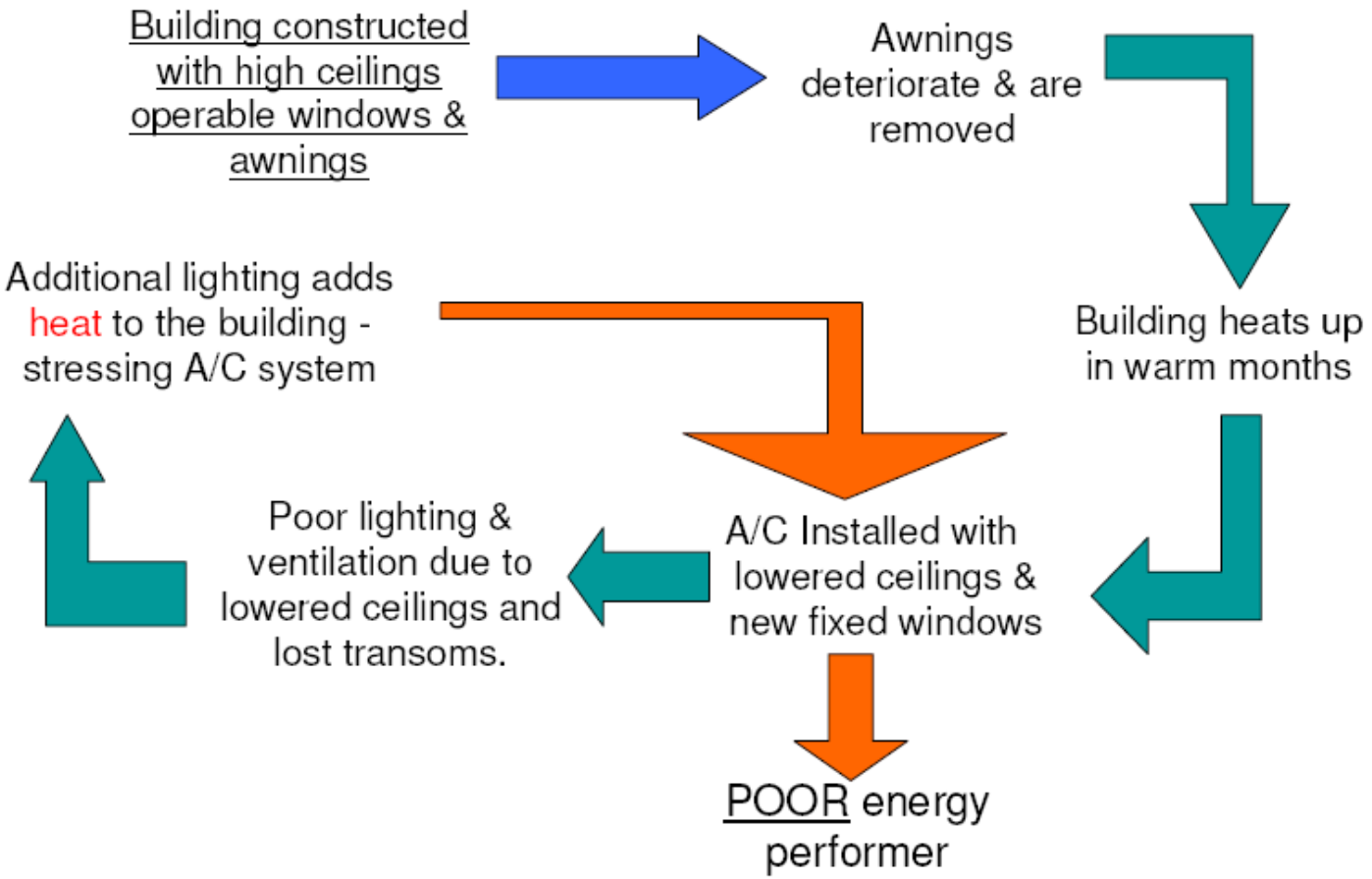


HISTORIC BUILDINGS ARE TYPICALLY FOUND IN DENSE URBAN CORES

HOW HISTORIC BUILDINGS CONTRIBUTE:
ORIGINALLY EFFICIENT

Historic Energy & Atmosphere

Minimum Energy Performance:



OPTIONS for
ENERGY EFFICIENCY in EXISTING BUILDINGS

COMMISSION REPORT

December 2005
CEC-400-2005-039-CMF

Arnold Schwarzenegger
Governor

ENERGY EFFICIENCY POLICIES

Figure ES-1

Cumulative Energy Savings of California Standards and Energy Efficiency Programs

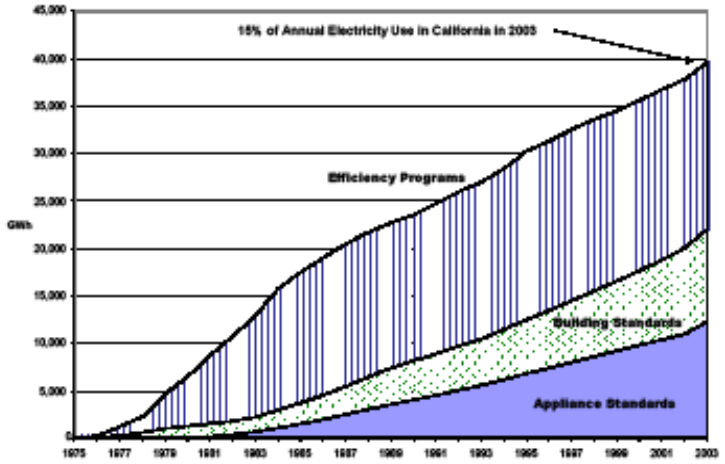


Figure 2-1

Annual Spending by PG&E, SCE, and SDG&E
For Energy Efficiency Programs

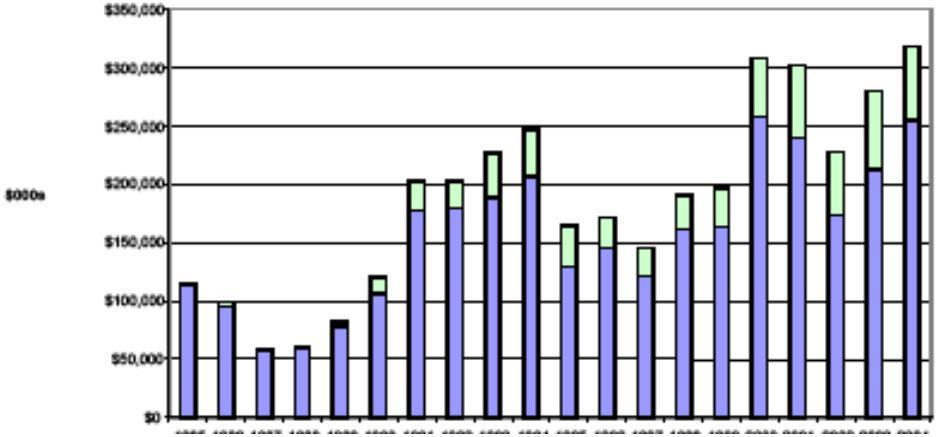


Figure ES-2

Total Electricity Use, per capita, 1960 - 2001

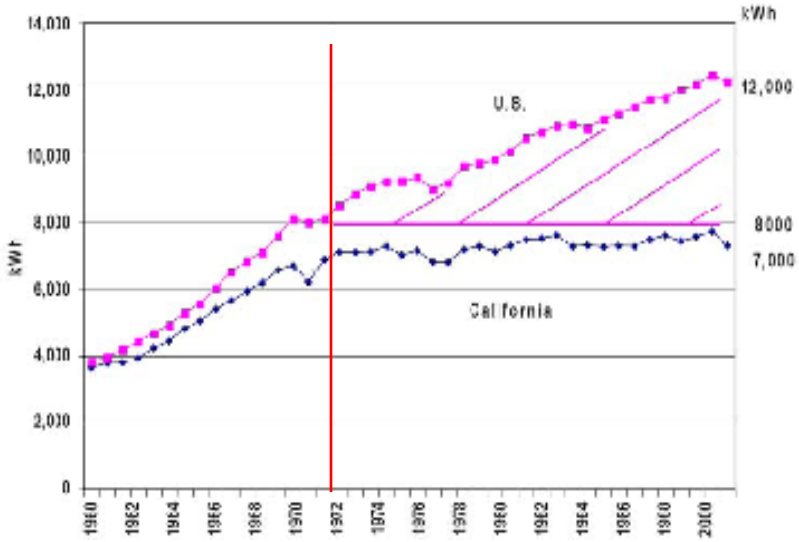
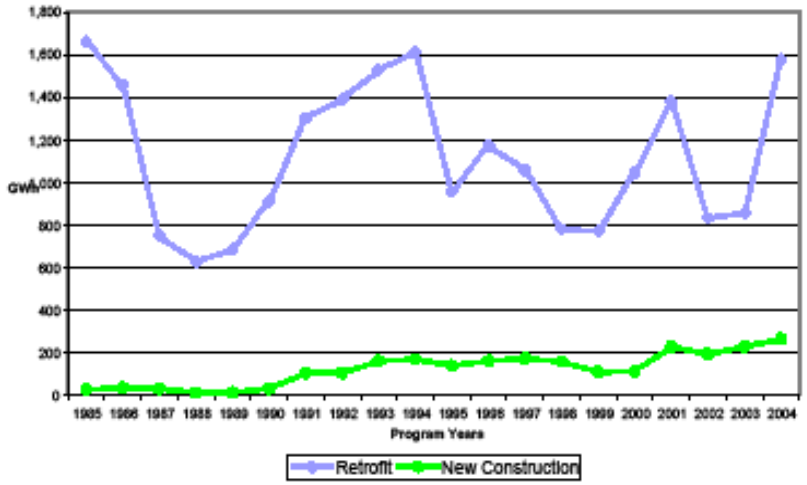
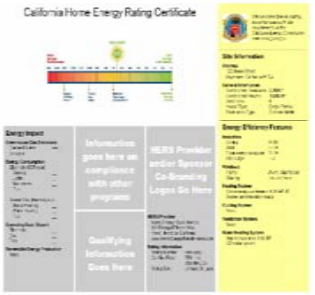


Figure 2-2

First Year Savings for Retrofit and New Construction Sectors for PY 1985-2004



ENERGY EFFICIENCY POLICIES
5 RESIDENTIAL STRATEGIES



1. Time of Sale Information Disclosure by 2010
   - Includes Home Energy Ratings System index

2. 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

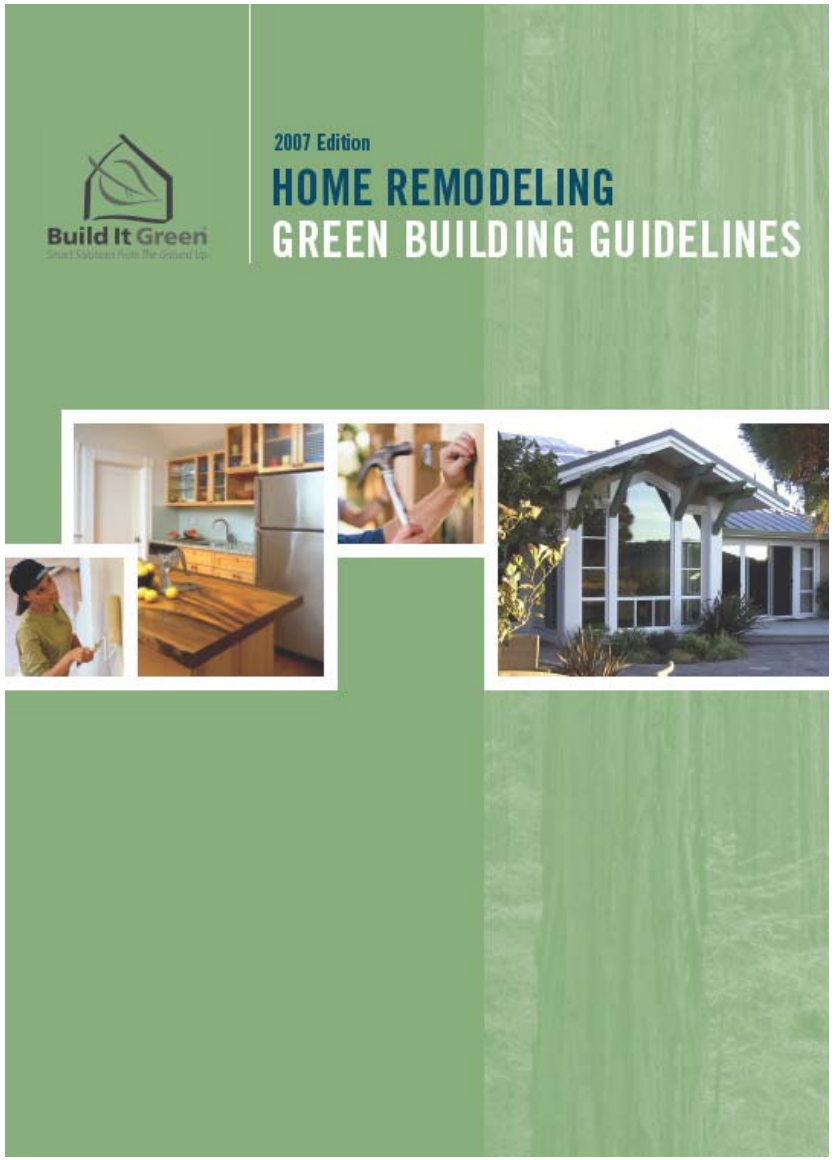
3. Integrated Whole Building Diagnostic Testing and Repair
   - Finds and corrects flaws in construction or operation
   - Increases energy efficiency and health and comfort

4. Assistance to Affordable Housing
   - Triggered at rehabilitation and equipment replacement

5. Equipment Tune-Ups
   - Increased frequency and effectiveness of HVAC system tune-ups

OPTIONS FOR ENERGY EFFICIENCY POLICIES

THIRD PARTY ENERGY CONSERVATION PROGRAMS



OPTIONS FOR ENERGY EFFICIENCY POLICIES

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.

OPTIONS FOR ENERGY EFFICIENCY POLICIES

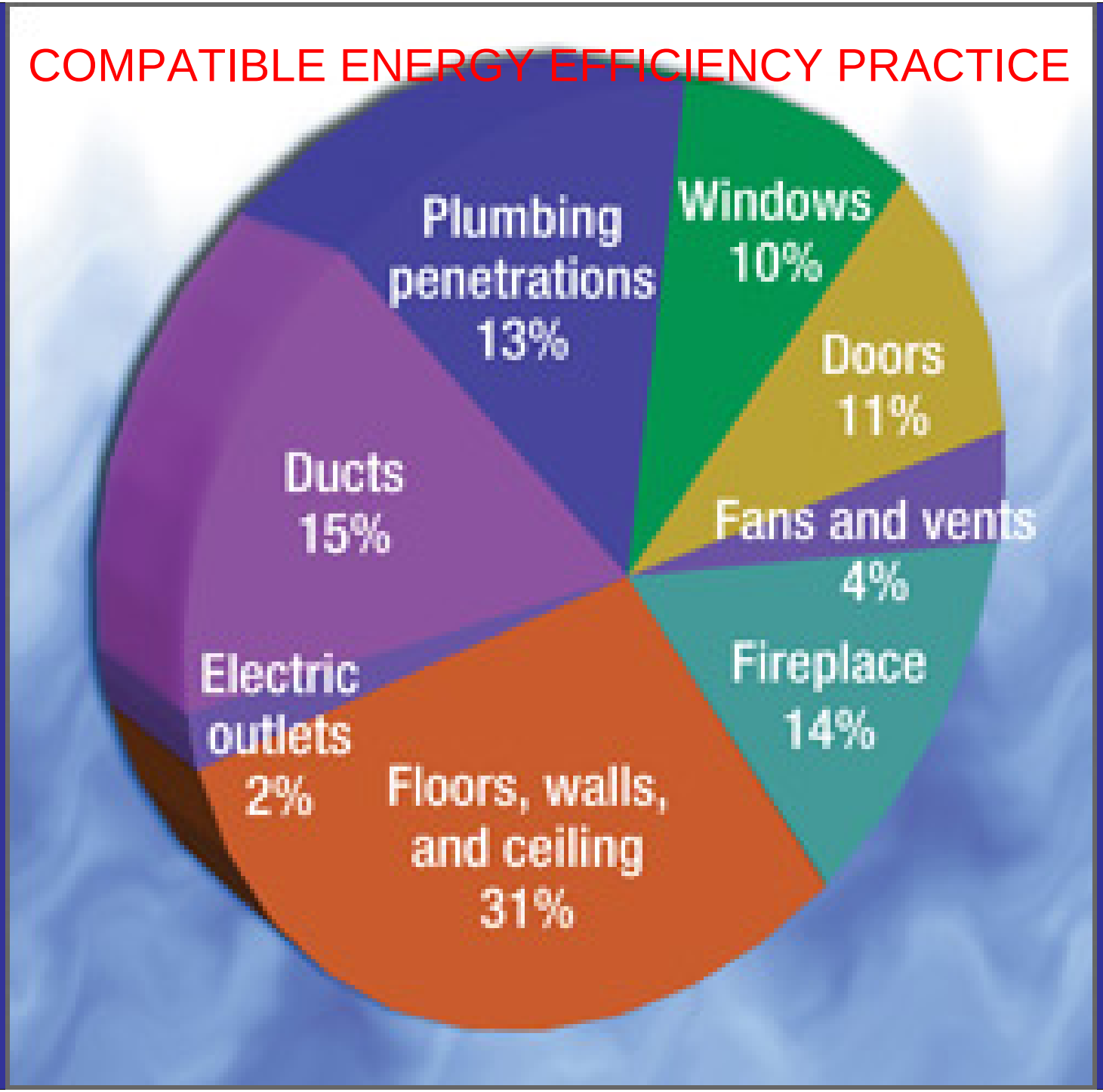
CEQA AND GENERAL PLANS

ENFORCEABLE MEASURES TO MITIGATE GREENHOUSE GASSES TO BE INCORPORATED INTO GENERAL PLANS

STOCKTON CITED FOR FAILING TO ADDRESS GREENHOUSE GAS REDUCTION IN A MEANINGFUL AND CONSTRUCTIVE MANNER IN JANUARY 2008

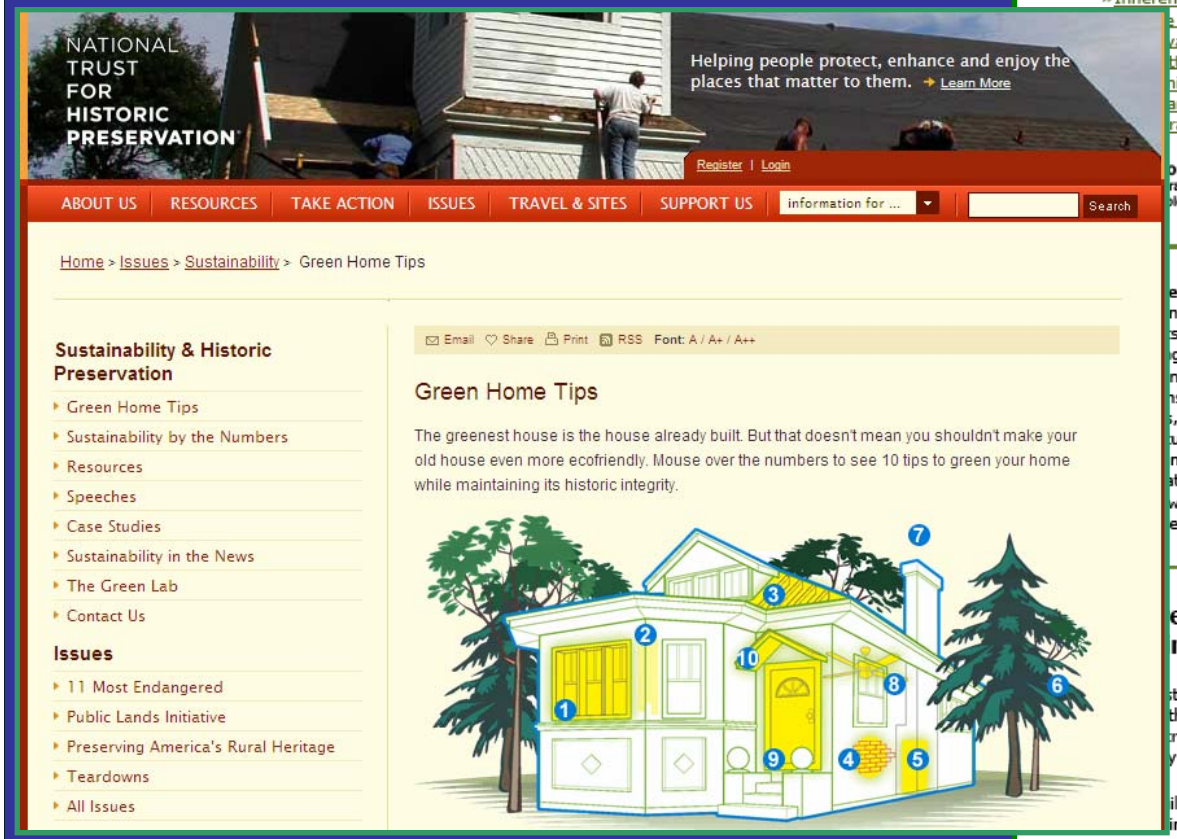
COMPATIBLE ENERGY EFFICIENCY PRACTICE

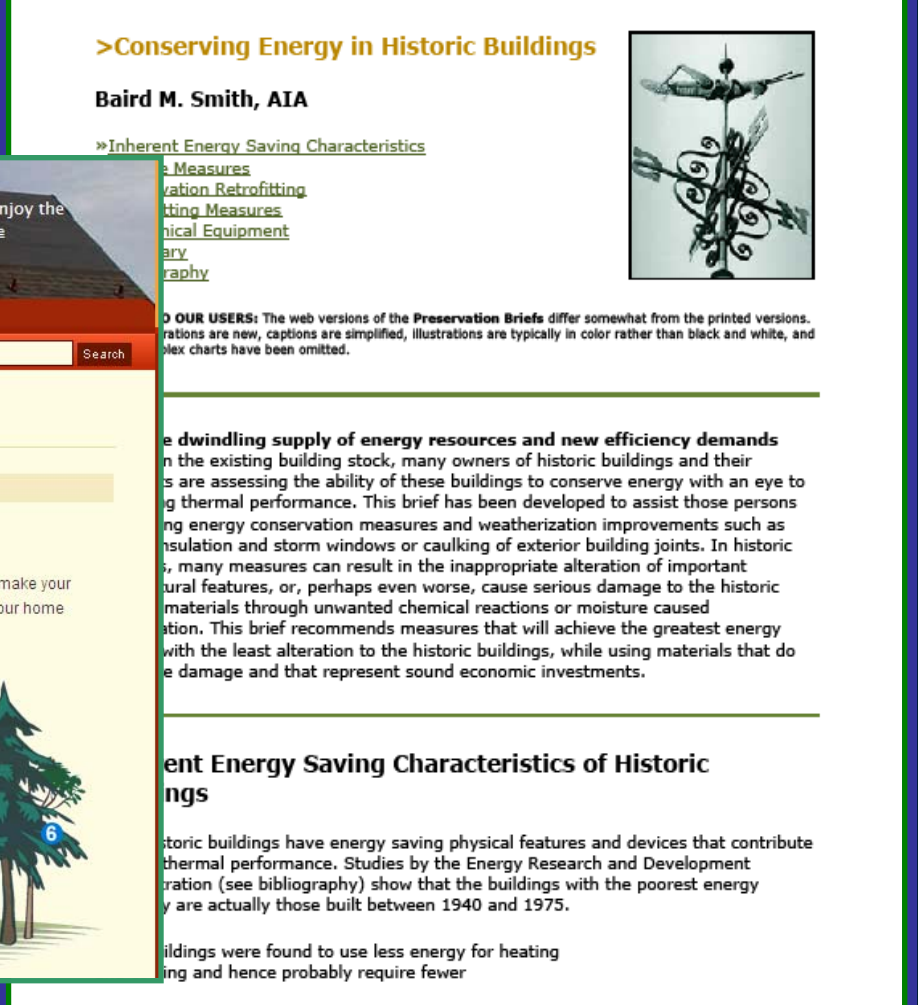
COMPATIBLE ENERGY EFFICIENCY PRACTICE



COMPATIBLE ENERGY EFFICIENCY PRACTICE

Step 1: Planning





COMPATIBLE ENERGY EFFICIENCY PRACTICE

Step 2: Quantification

California Building Performance Contractors Association

cbpca

CABEC California Association of Building Energy Consultants

npr

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.

Weathering 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.

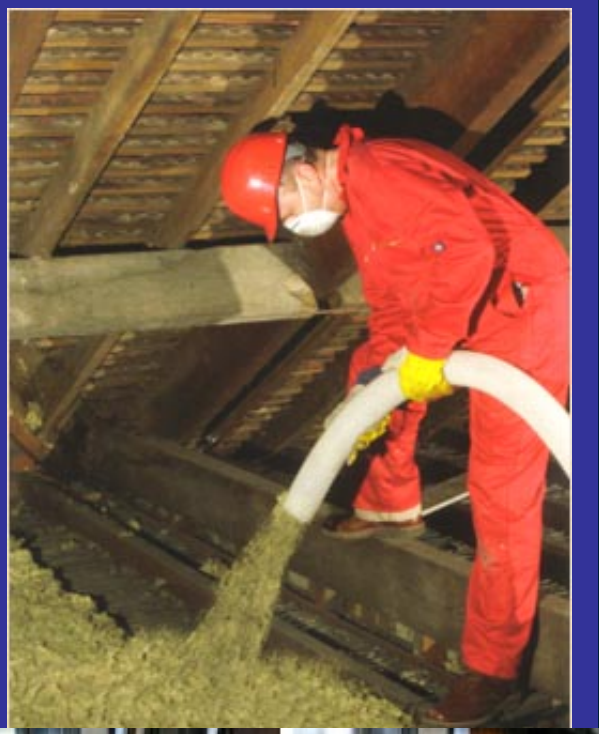
Logston and his three-man crew recently spent a day going over Moorman's house. By running a big exhaust fan that pulls air out of the house, they create a low-pressure zone inside that draws cold air into the house through cracks

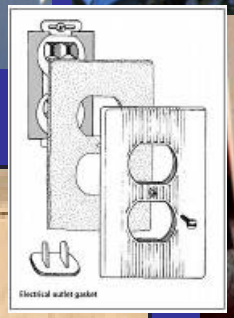
COMPATIBLE ENERGY EFFICIENCY PRACTICE

Step 2: Quantification

COMPATIBLE ENERGY EFFICIENCY PRACTICE

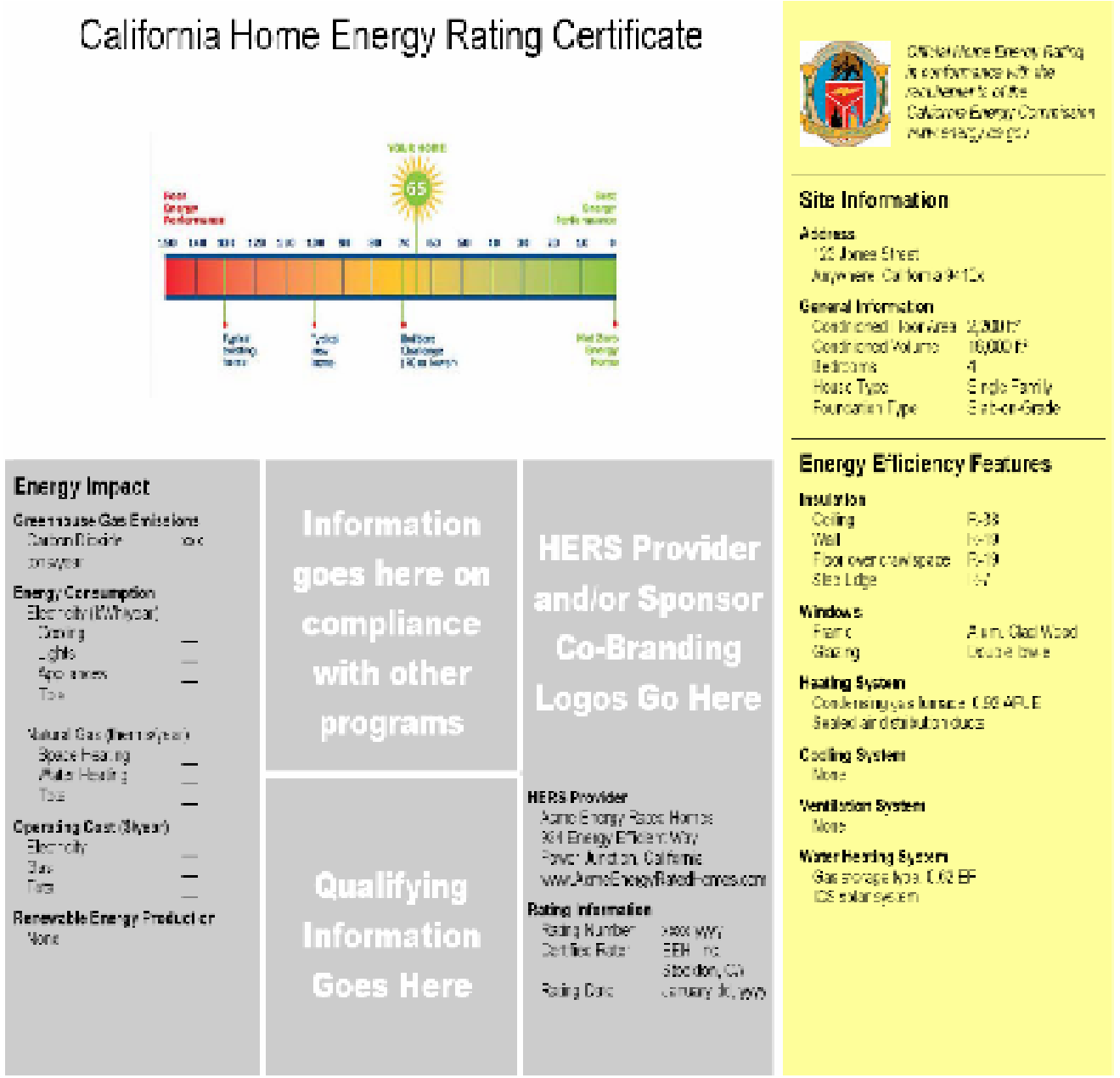
Step 3: Installation





COMPATIBLE ENERGY EFFICIENCY PRACTICE

HERS II



COMPATIBLE ENERGY EFFICIENCY PRACTICE

Secretary of the Interior's 10 Standards for Rehabilitation

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

COMPATIBLE ENERGY EFFICIENCY PRACTICE

Issues: Landscaping

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COMPATIBLE ENERGY EFFICIENCY PRACTICE

Issues: Rehabilitation of original finishes

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COMPATIBLE ENERGY EFFICIENCY PRACTICE

Issues: Removal of original or addition of inappropriate features

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COMPATIBLE ENERGY EFFICIENCY PRACTICE

On-Site Energy Options

Solar Rights Act

Civil Code Section 714:

714. (a) Any covenant, restriction, or condition contained in any deed, contract, security instrument, or other instrument affecting the transfer or sale of, or any interest in, real property that effectively prohibits or restricts the installation or use of a solar energy system is void and unenforceable. (b) This section does not apply to provisions that impose reasonable restrictions on solar energy systems. However, it is the policy of the state to promote and encourage the use of solar energy systems and to remove obstacles thereto. Accordingly, 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.

COMPATIBLE ENERGY EFFICIENCY PRACTICE

Off-Site Energy Options

SMUD solar shares

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

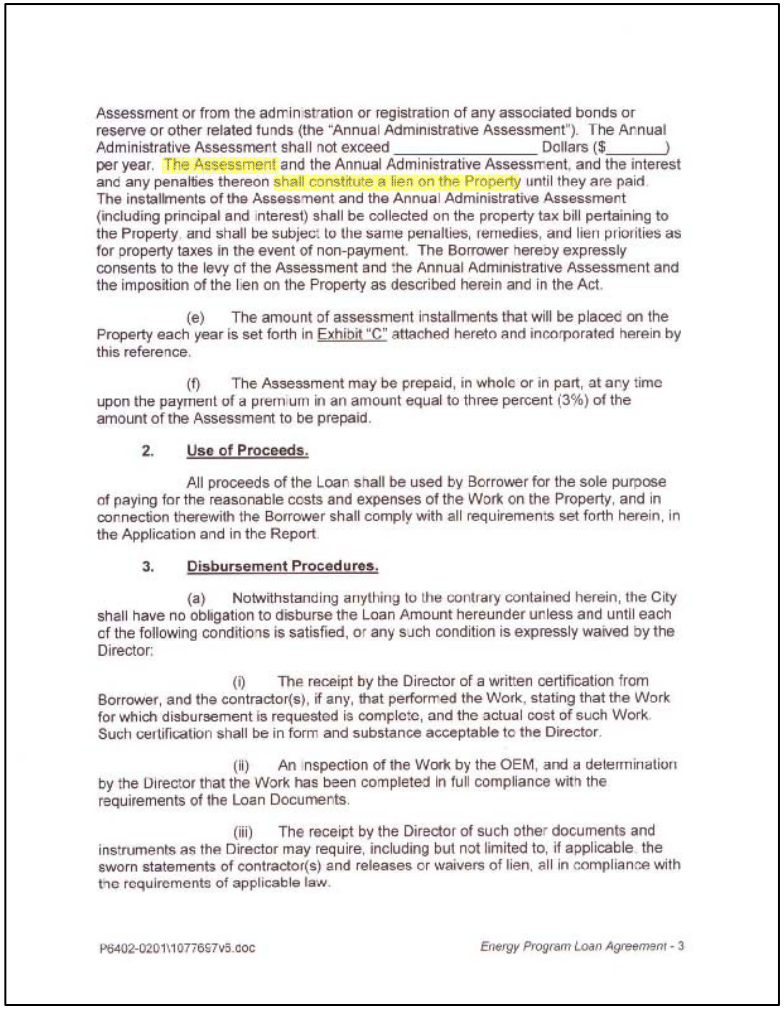
FINANCIAL INCENTIVES

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.

Palm Desert loan document that describes the loan for a renewable energy system or energy efficient equipment as an assessment to the property.



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.

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FINANCIAL INCENTIVES

Estimated Costs

Berkeley calculates the cost to retrofit existing homes.

	Per unit	Total Cost
Single Family (23,000)		
Performance Test	$750	$17,250,000
Improvements	$7,500	$172,500,00
Multi-Family (25,000)		
Performance Test	$150	$3,750,000
Improvements	$1,500	$37,500,000
Total Residential Costs		**$231,000,000**

FINANCIAL INCENTIVES

Berkeley FIRST: The Basics

- Enables property owners to install energy projects w/ no upfront cost
- City provides financing thru issuing bond
- Cost repaid on property tax bill over 20 years
- Based on 'voluntary assessment district' concept (Mello-Roos Community Facilities Act of '82)

- Start w/ PV, then move to thermal & efficiency

FINANCIAL INCENTIVES

2008 Berkeley FIRST Pilot Program

- Initial pilot was open to 40 properties
- Bond issuance for $1.5 million
- Renewable Funding, LLC purchased the bonds and administered online application process

Phase 2 will include efficiency and solar thermal

- Financing availability?

FINANCIAL INCENTIVES

Benefits to Property Owners

Addresses major barriers to energy improvements:

- **High upfront cost to property owner**
- **Long payback period**

Benefits:

- **No upfront cost to property owner**
- **Payments fixed for 20 years**
- **Payments stay with the property**
- **Financing competitive with traditional equity line**
- **Decreased utility bills**

FINANCIAL INCENTIVES

CityFIRST: How it Works

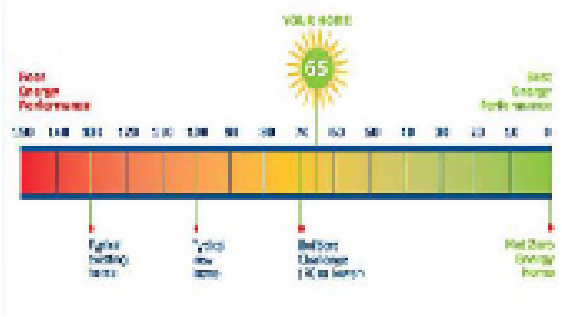
Contact: Renewable Funding

www.renewfund.com

FINANCIAL INCENTIVES

HERS II

California Home Energy Rating Certificate



Energy Impact

Greenhouse Gas Emissions
Carbon Dioxide
tons/year

Energy Consumption
Electricity (kWh/year)
Cooling
Lights
Appliances
Total

Natural Gas (therms/year)
Space Heating
Water Heating
Total

Operating Cost ($/year)
Electricity
Gas
Total

Renewable Energy Production
None

Information goes here on compliance with other programs

Qualifying Information Goes Here

HERS Provider and/or Sponsor Co-Branding Logos Go Here

HERS Provider
Acme Energy Rated Homes
101 Energy Efficient Way
Power Junction, California
www.AcmeEnergyRatedHomes.com

Rating Information
Rating Number
Certified Rater
Rating Date

Official Home Energy Rating
in conformance with the
requirements of the
California Energy Commission
www.energy.ca.gov

Site Information

Address
123 Jones Street
Anywhere, California 94123

General Information
Conditioned Floor Area 2,300 ft²
Conditioned Volume 18,000 ft³
Bedrooms 4
House Type Single Family
Foundation Type Slab-on-Grade

Energy Efficiency Features

Insulation
Ceiling R-38
Wall R-19
Floor over crawl space R-19
Slab Edge R-7

Windows
Frame Fiberglass Clad Wood
Glazing Double Low-e

Heating System
Condensing gas furnace 0.95 AFUE
Sealed air distribution ducts

Cooling System
None

Ventilation System
None

Water Heating System
Gas storage heater 0.62 EF
ICS solar system

FINANCIAL INCENTIVES

STIMULUS BILL: $250 M GRANT; TAX CREDIT EXTENTION

H. R. 1

One Hundred Eleventh Congress
of the
United States of America

HOUSING PROGRAMS

ASSISTED HOUSING STABILITY AND ENERGY AND GREEN RETROFIT INVESTMENTS

For assistance to owners of properties receiving project-based assistance pursuant to section 202 of the Housing Act of 1959 (12 U.S.C. 17012), section 811 of the Cranston-Gonzalez National

Tax Credits for Energy-Efficient Improvements to Existing Homes. The bill would extend the tax credits for improvements to energy-efficient existing homes through 2010. For 2009 and 2010, the bill would increase the amount of the tax credit to thirty percent (30%) of the amount paid or incurred by the taxpayer for qualified energy efficiency improvements during the taxable year. The bill would also eliminate the property-by-property dollar caps on this tax credit and provide an aggregate $1,500 cap on all property qualifying for the credit.

subchapter IV of chapter 31 of title 40, United States Code: *Provided*

TITLE IV—ENERGY AND WATER DEVELOPMENT

OHP RESOURCES

Sustainable Preservation Coalition

Working together on integration of preservation values into the revised version of LEED.

NATIONAL TRUST for HISTORIC PRESERVATION

API INTERNATIONAL

AIA

NATIONAL PARK SERVICE

GSA

NCSHPO

OHP RESOURCES

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Tell us your experiences with sustainable preservation

www.ohp.parks.ca.gov