

Residential Energy Reduction in California Real Estate

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Today's Topics

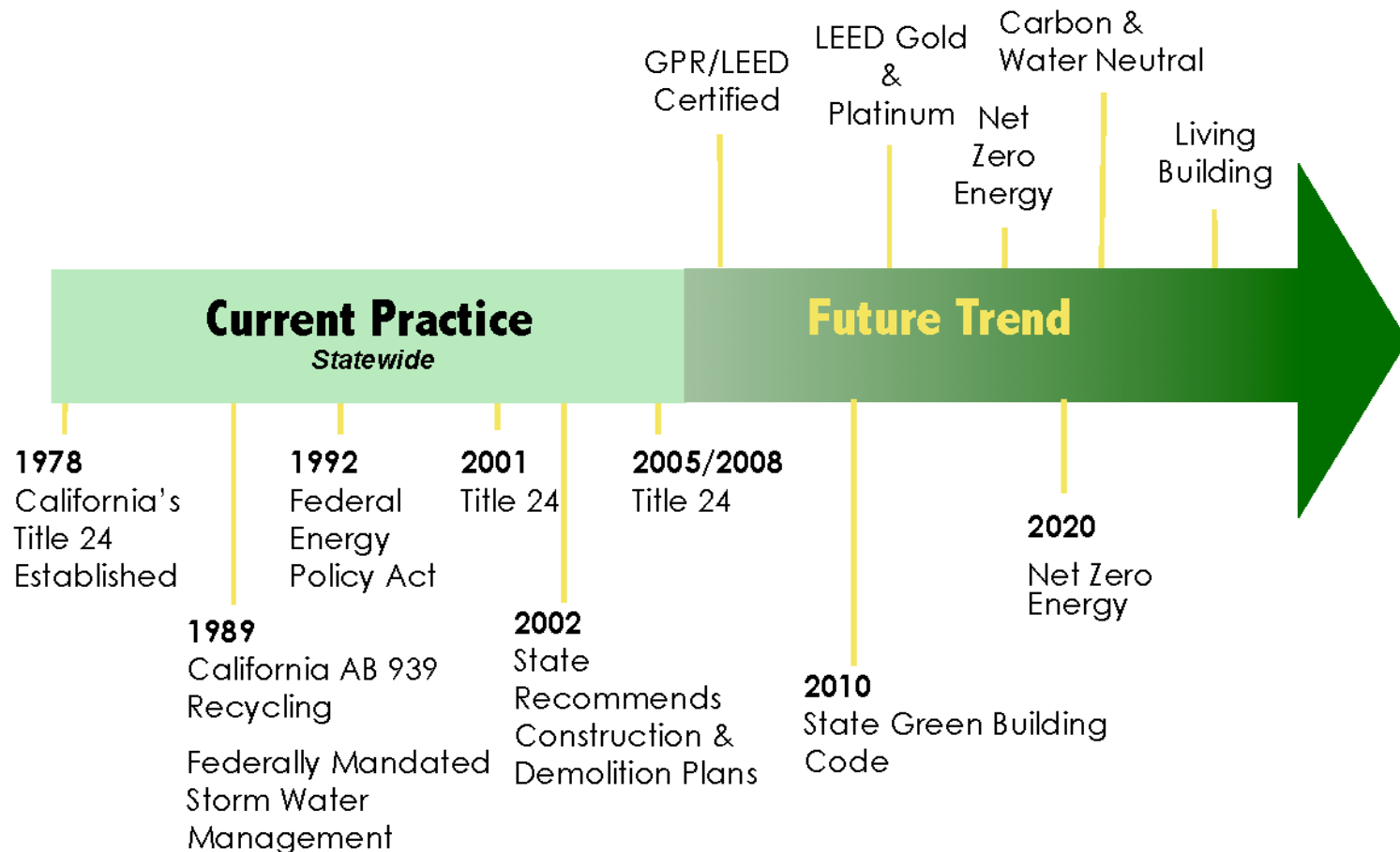
- California Energy Efficiency Standards
- Energy Standards Enforcement
- Energy “Rating”
- Proving a home’s “Green Value”
- Voluntary Green Home Standards
- Energy Efficient Mortgages
- Existing Home Inspection & Analysis
- Q & A



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Trends in Green Building

Green Building Related to Local, State & Federal Regulations



Energy Efficiency Standards

- First adopted 1978, changes on 3 yr cycle
- Created California Energy Commission
- Prescriptive or performance compliance
- Limit window area, double pane windows, induced draft furnaces, florescent lighting, etc.
- Results: CA energy consumption near plateau, per capita energy use declining
- 2008 Standard delayed until 1/1/2010

Energy Standards Enforcement

- Code enforced by local building Depts.
- Certified Energy Plan Examiners
- HERS Raters
- No CA requirements at time of resale (yet)
- New York, Ohio, Massachusetts, Nevada, City of San Francisco require audits
- Berkeley requires audit and upgrades



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Energy Modeling

- DOE2 software from Lawrence Berkeley Labs
- EnergyPro and MicroPass
- Enter data from plans or measurements
- Furnace type and efficiency
- Local climate/solar data
- Predicts energy consumption
- Compare with “energy budget”



Home Energy Rating System (HERS)

- Raters are trained and certified by “HERS Providers”
- Field verification and diagnostic testing
- Energy modeling in software
- See sample CHEERS report
- Purposes: new home compliance, existing home repairs and remodeling



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Proving Home Value

- Growing segment of green buyers
- Motivators: concern with rising energy prices, global warming worry, need for professional evaluations
- Some studies indicate increased value for independent proof of efficiency
- Sid Frederick's evaluation
- Types of evaluations: HERS, GreenPoint
- Will audits be required at time of sale?



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Voluntary Green Building Standards

- GreenPoint, Energy Star, LEED
- Green branding initiatives for new homes
- Collaboration among builder, rater and provider
- All have detailed checklists and measures
- Require field verification by HERS Rater
- Require document submissions to agency
- Difficulty of qualifying varies
- Relative brand recognition and value unknown

Voluntary Standards: Greenpoint

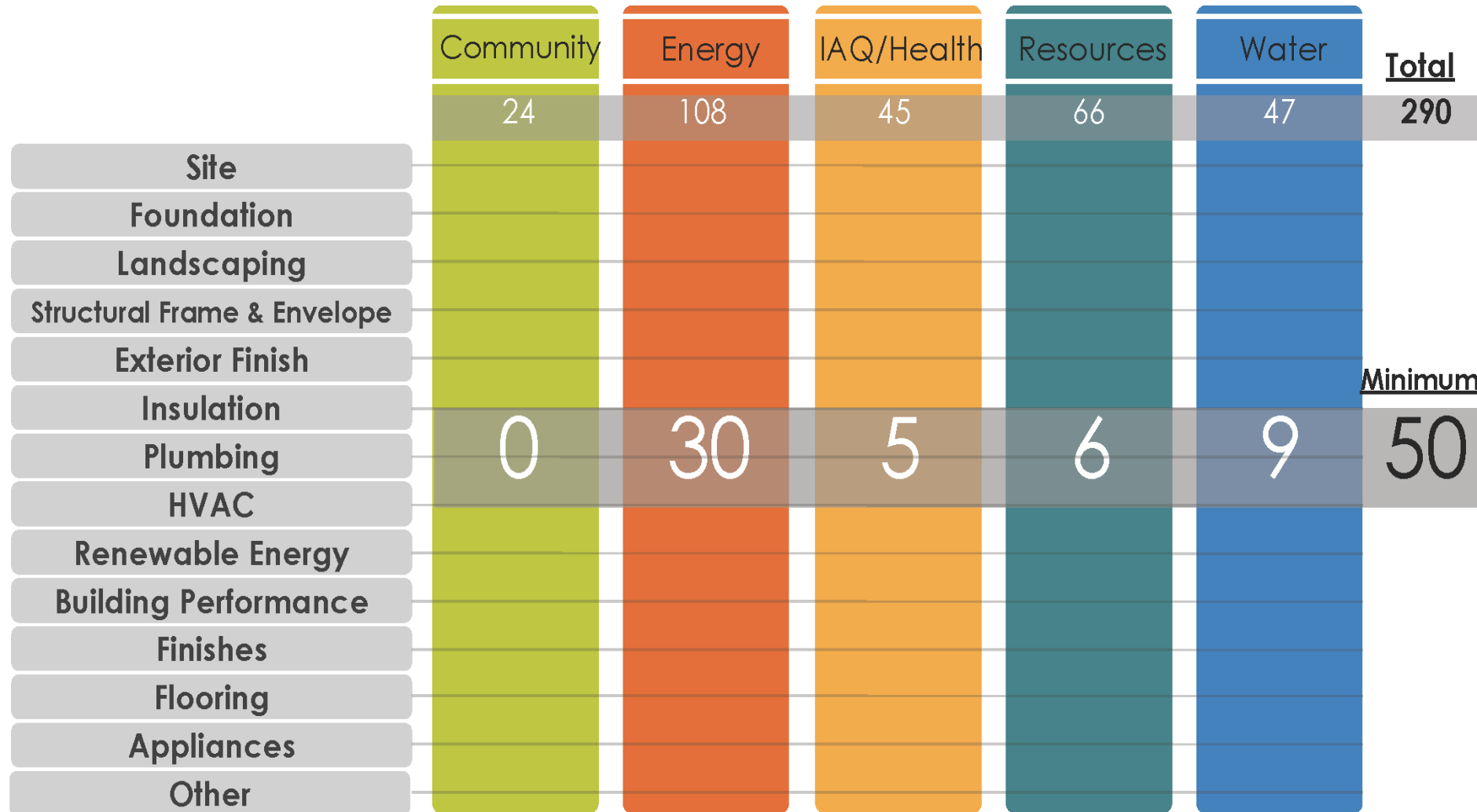
- Build It Green: Berkeley
- California only program
- Prerequisite of 15% better than CA standard
- Checklist incorporated in building plans
- Easy to get Energy Star in addition
- Rated home gets a GreenPoint score
- New program for existing homes starting



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Green Point Rated: Basic Req's.

Categories & Minimum Points



Voluntary Standards: Energy Star

- Program of the U.S. Dept. of Energy
- Recognized national brand
- Owner gets certificate and sales brochures
- 15% more efficient than CA standards
- Most GreenPoint homes also receive Energy Star distinction



Certificate Of Compliance : Residential

(Part 1 of 4) **CF-1R**

8/16/2007

Date

Building Permit #

Plan Check/Date

Field Check/Date

Energy Calc Co.

Documentation Author

EnergyPro

Compliance Method

CA Climate Zone 02

Climate Zone

TDV (kBtu/sf-yr)	Standard Design	Proposed Design	Compliance Margin
Space Heating	13.64	10.83	2.81
Space Cooling	7.16	3.95	3.21
Fans	1.79	1.25	0.54
Domestic Hot Water	18.11	15.91	2.20
Pumps	0.00	0.00	0.00
Totals	40.70	31.93	8.77

Percent better than Standard:

21.5%

BUILDING COMPLIES - HERS VERIFICATION REQUIRED

Building Type:	<input type="checkbox"/> Single Family	<input type="checkbox"/> Addition	Total Conditioned Floor Area:	4,197 ft ²	
	<input checked="" type="checkbox"/> Multi Family	<input type="checkbox"/> Existing + Add/Alt	Existing Floor Area:	n/a ft ²	
Building Front Orientation:	(S) 170 deg		Raised Floor Area:	0 ft ²	
Fuel Type:	Natural Gas		Slab on Grade Area:	2,607 ft ²	
Fenestration:			Average Ceiling Height:	8.0 ft	
Area:	620 ft ²	Avg. U:	0.38	Number of Dwelling Units:	4.00
Ratio:	14.8%	Avg. SHGC:	0.35	Number of Stories:	2

BUILDING ZONE INFORMATION

Zone Name	Floor Area	Volume	# of Units	Zone Type	Thermostat Type	Vent Hgt.	Vent Area
Res HVAC	4,197	33,574	4.00	Conditioned	Setback	8	n/a

OPAQUE SURFACES

Type	Frame	Area	U-Fac.	Insulation Cav.	Act. Cont.	Act. Azm.	Tilt	Gains Y / N	Condition Status	JA IV Reference	Location / Comments
Roof	Wood	2,438	0.032	R-30	R-0.0	170	0	<input checked="" type="checkbox"/> <input type="checkbox"/>	New	01-A7	Residence



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Voluntary Standards: LEED

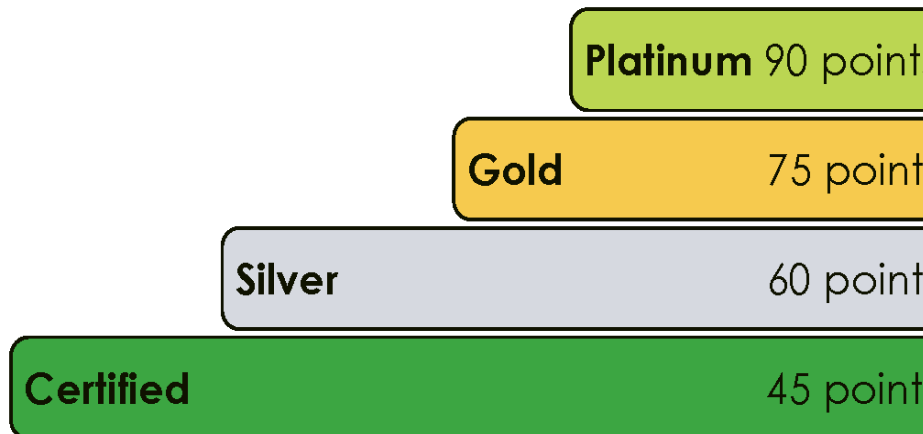
- U.S. Green Building Council
- New program
- Energy Star is prerequisite
- HERS Rating required
- Most difficult and expensive to qualify for
- Performance testing required
- Targets top 25% of green home builders
- If LEED, then GreenPoint assured

LEED for Homes: Basic Requirement

Points Available



Points Thresholds



Energy Efficient Mortgages

- Finance energy saving upgrades as part of new or refi mortgage.
- HERS rating and analysis of upgrade costs/benefits required.
- Total lifetime value of all savings must exceed cost of all improvements
- Can qualify for bigger loans on Energy Star or conventional homes—energy savings mean more budget for mortgage payments



EEMS, cont'd

- Now can finance up to 5% of home value
- Not well publicized or understood
- Not available as home improvement loans
- FHA and VA sponsor EEMs
- Fannie Mae and Freddie Mac buy them up
- Contact Fannie or Freddie for lender lists



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Existing Home Audits

- Specialized home inspection
- Reduce energy costs and carbon footprint
- Solve problems of safety, durability and comfort
- Interview, inspection, testing, modeling, analysis, and report
- Use blower door, duct blaster, manometer, CO meter, IR gun, thermal imaging



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Diagnostic Equipment

- Blower Door



- Duct Blaster



Typical Findings from an “Audit”

- Conservation beats generation
- Very cost effective projects apparent
- Home envelope very leaky—seal up
- Duct system very leaky—seal up
- Deferred maintenance on equipment and envelope
- Inadequate and poorly installed insulation
- Windows not shaded from sun’s heat
- Window replacement not cost effective



Who need an energy inspection?

- Buyer/seller is a “green” committed to reducing energy use
- Concern over actual/possible high PG&E bills
- Motivated to use Obama stimulus funds, CA rebates
- Large, older house
- No recent major remodels, upgrades, audits
- Owner wants advice on range of possible upgrades, remodels



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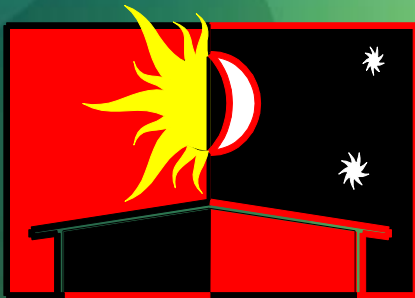
State of Energy Consulting Field

- Architectural energy field mature and functioning well
- Existing home market is emerging with growing pains
- Training and competence vary widely
- Several small and competing training and certification non-profits
- Certification standards too low



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