



Workforce Instructions for
Standards and Efficiency

EPIC WISE

Workforce Education for Standards and Efficiency



ConSol

- Energy consulting – local, state and national
 - Energy analysis and design
 - Mechanical engineering - focused on hot and dry
 - Inspections and diagnostics – residential and commercial
 - Auditor for retrofit programs for Central Valley, CA
 - One of two CEC certified registries for CA Energy Code
- Residential
 - California - Chair, CBIA Energy and Codes Committee
 - Governor’s Advisory Board - CALGreen
 - NAHB – Energy and Green Subcommittees, Energy Efficient Buildings Tax Credit Working Groups
 - NGBS 2015 ICC-700 Consensus Committee
- Commercial
 - California Building Properties Association
 - BOMA California, NAOIP, ICSC, IREM, RILA

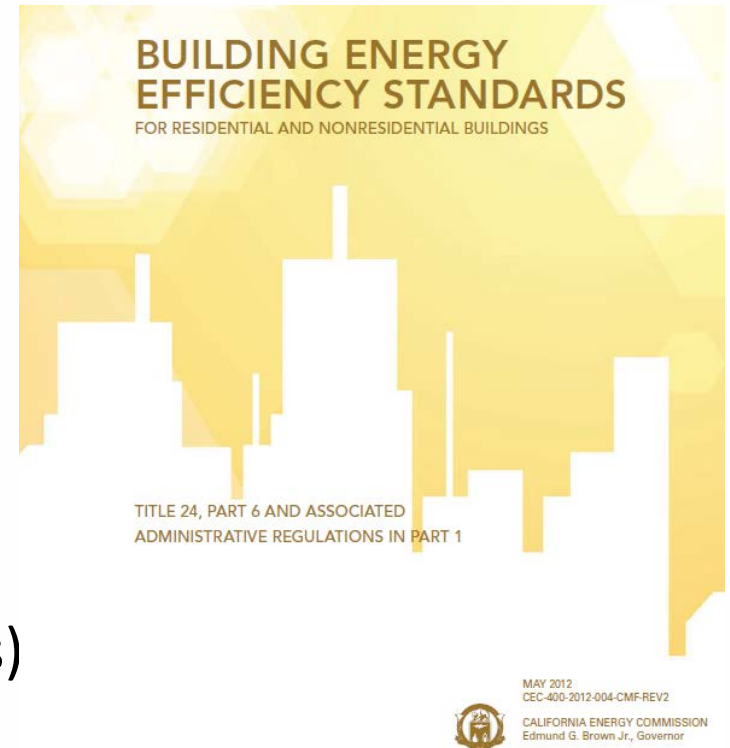


2016 Energy Code Changes

- Four significant changes
 - High Performance Attics
 - High Performance Walls
 - 0.82 EF Water Heaters
 - LED lighting
 - Solar Trade-Off

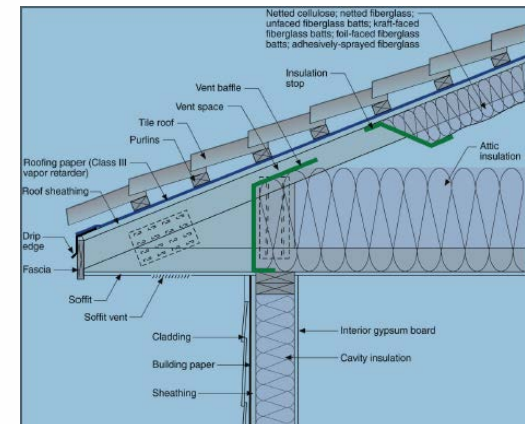
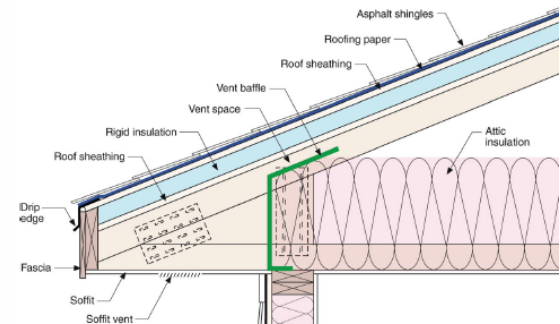
≈30% energy savings (reg. loads)

≈\$2,750 cost per home



High Performance Attics

- Several Compliance Options
 - Above roof-deck insulation
 - Vented attic design
 - R-38 at ceiling in all CZs, *plus*
 - Above deck=R-6 rigid foam *OR*
 - Below deck=R-13
 - batt/blown fiberglass, OR
 - cellulose, OR
 - Spray Polyurethane Foam
 - No radiant barrier required



Source: Building Science Corporation, Hydrothermal Analysis of California Attics, 2011



High Performance Attics cont'd

- OR
 - Unvented attic design:
 - No ceiling insulation between house and attic
 - R-38 below roof deck (performance could be less)
 - Except CZs 3 and 5-7 require R-30
 - Ceiling insulation minimum mandatory dropping to R-22
 - Unvented attics ease solar ready requirements



High Performance Walls

- Current (2013) Prescriptive all CA CZs:
 - U-factor = 0.065
 - R-15+4 or R-13+5 (2x4 framing)
- Proposed Prescriptive - 2016
 - U-factor = 0.051 (except CZ 6 and 7)



TRADITIONAL WALL ASSEMBLY TABLE

Table 4.3.1 – U-factors of Wood Framed Walls

Spacing	Cavity Insulation	Nominal Framing Size	Rated R-value of Continuous Insulation ²							
			R-0	R-2	R-4	R-5	R-6	R-7	R-8	
			A	B	C	D	E	F	G	
16 in. OC	None	Any	1	0.356	0.209	0.146	0.127	0.113	0.101	0.092
	R-11	2x4	2	0.110	0.088	0.074	0.068	0.064	0.060	0.056
	R-13	2x4	3	0.102	0.082	0.069	0.064	0.060	0.056	0.053
	R-15 ¹	2x4	4	0.095	0.077	0.065	0.060	0.056	0.053	0.050
	R-19	2x6	5	0.074	0.063	0.055	0.051	0.049	0.046	0.044
	R-21 ¹	2x6	6	0.069	0.059	0.051	0.048	0.046	0.043	0.041
	R-22	2x6	7	0.072	0.062	0.054	0.051	0.048	0.045	0.043
24 in. OC	None	Any	12	0.362	0.211	0.148	0.128	0.114	0.102	0.092
	R-11	2x4	13	0.106	0.086	0.072	0.067	0.062	0.059	0.055
	R-13	2x4	14	0.098	0.079	0.067	0.062	0.058	0.055	0.052
	R-15	2x4	22	0.091	0.074	0.063	0.059	0.055	0.052	0.049
	R-19	2x6	15	0.071	0.061	0.053	0.050	0.048	0.045	0.043
	R-21 ¹	2x6	16	0.066	0.057	0.050	0.047	0.045	0.042	0.040
	R-22	2x6	17	0.069	0.060	0.052	0.049	0.047	0.044	0.042

Notes

1. Higher density fiberglass batt is required in these cases.
2. Continuous insulation may be installed on either the inside or the exterior of the wall, or both.

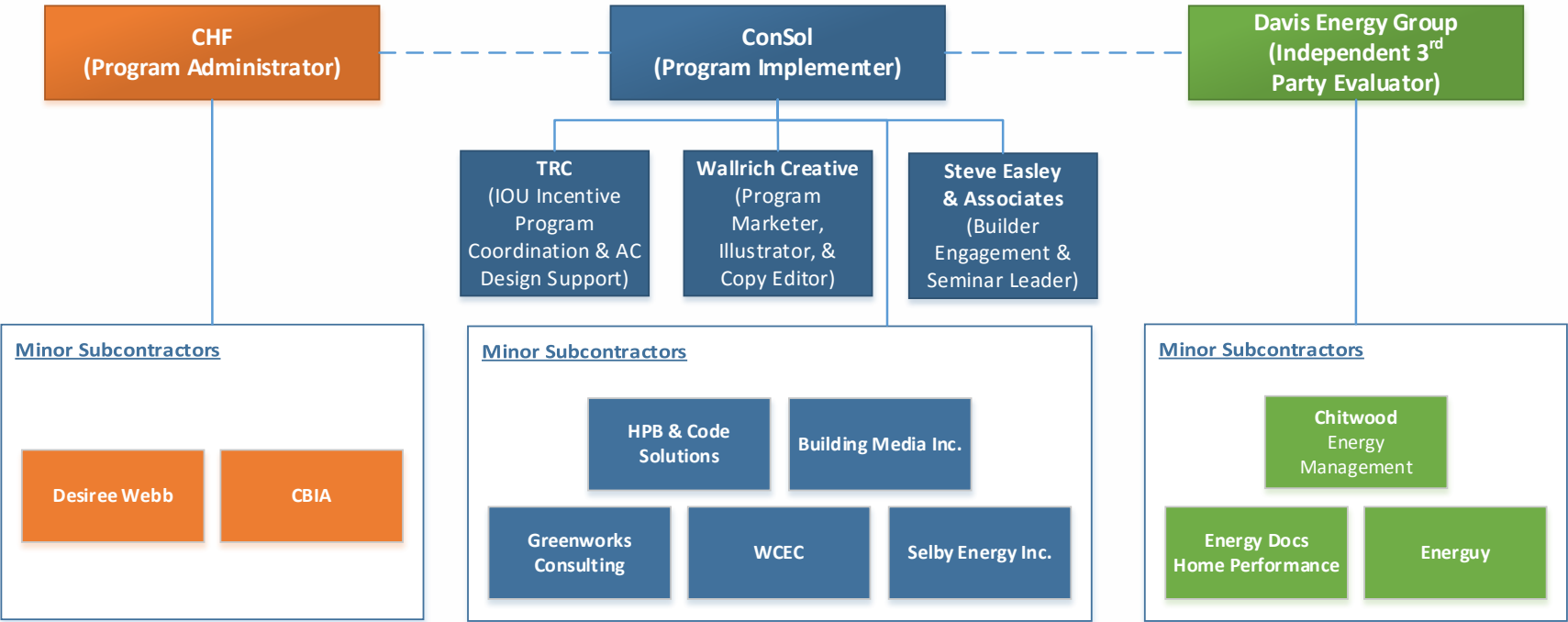


High Performance Walls

- U-factor ≈ 0.051
- R-19+5
2"x6" framing plus *at least* 1" of foam
- R-15+8
2"x4" framing plus ≈ 2 inches of foam
 - No R-8/inch product currently in the market
 - 2" foam causes problems for window installation



EPIC WISE



EPIC WISE

- Meet with Builders to present solutions
 - Meeting would include the senior management, project management and purchasing for the project
 - WISE team will present multiple solutions for meeting high performance walls and attics along with projected cost
 - WISE team will work to understand builder concerns and address each one
 - Builder team will select a solution best suited for their product



EPIC WISE

- Develop, coordinate and implement on-the-job training
 - WISE team will work with the builder to create a working group including: Builder, WISE team, Architect, Engineers, Energy Consultant, HERS Rater, Relevant Subcontractors and Product Manufactures
 - Working Group will ensure that all plans and details are done correctly to implement the chosen solution
 - Working Group will ensure all subcontractors, consultants and builder staff understand all installation requirements
 - Working Group will review all contract scopes of work and subcontractor bids to ensure accuracy. Will ensure nothing is being bid that is unnecessary in order to keep costs down
 - WISE team will coordinate jobsite training for all relevant trades as well as the builders staff to ensure installers are working efficiently and the product is installed properly



EPIC WISE

- Through working with our team the intended benefits to the builder are:
 - Reduced heating and cooling loads
 - Reduced exposure to rate spikes
 - Reduced builder training costs
 - Reduced installation time and cost



California Energy Goals

“BIG BOLD” ENERGY EFFICIENCY STRATEGIES



In order to guide market transformation in a number of key sectors, this Plan embraces four specific programmatic goals, known as the “Big Bold Energy Efficiency Strategies,” established by the CPUC in D.07-10-032 and D.07-12-051. These goals were selected not only for their potential impact, but also for their easy comprehension and their ability to galvanize market players.

1. All new residential construction in California will be zero net energy by 2020;
2. All new commercial construction in California will be zero net energy by 2030;
3. Heating, Ventilation and Air Conditioning (HVAC) will be transformed to ensure that its energy performance is optimal for California’s climate; and
4. All eligible low-income customers will be given the opportunity to participate in the low income energy efficiency program by 2020.



Questions?

