

ENERGY STAR Qualified Homes California Stakeholder Call

February 10, 2011

Agenda



- Introduction of participants
- EPA's goals for ENERGY STAR v3 guidelines
- EPA's goals for CA ENERGY STAR v3 guidelines
- Recap of 2010 stakeholder meeting
- Presentation of draft guidelines
- Illustrative examples of compliant packages
- Explanation of public comment period process
- Discussion

Introduction of Participants



- | | | | |
|----------------------------------|-----------------------------------|----------------------------------|--|
| 1. AmeriSpec | 18. DR Horton | 1. ESD | 18. Pulte Group / Pulte Home Corporation |
| 2. APP-TECH Inc. | 19. Davis Energy Group | 2. Evergreen Technologies | 19. Quality Energy Raters |
| 3. Bear Technologies | 20. De Young Properties | 3. Fard Engineers | 20. Residential Energy Efficiency Concepts |
| 4. Beazer Homes | 21. Design AVEnues LLC | 4. Gerald Stater & Company, Inc. | 21. Rick's Energy Solutions |
| 5. BEC Associates | 22. Design Tek Energy Compliance | 5. Glenn Woodbury Weatherization | 22. Robert Harold Construction |
| 6. Benningfield Group | 23. Douglas Beaman Associates | 6. Granville Homes, Inc. | 23. Shamim Engineering Consultants, Inc. |
| 7. Blanke & Associates | 24. Duct Testers, Inc. | 7. Green Home Savvy | 24. SolData Energy Consulting |
| 8. Bright Green Strategies | 25. Emerald Impact | 8. Hallmark Southwest Corp. | 25. Southern California Edison |
| 9. Cabec | 26. Enercomp, Inc. | 9. HERS | 26. Southern California Gas |
| 10. CalCERTS | 27. Energy Impacts | 10. Heschong Mahone Group | 27. Standard Pacific Homes |
| 11. California Energy Commission | 28. Energy Inspectors Corporation | 11. Home Energy Services | 28. State of CA, DGS / DSA |
| 12. California Living & Energy | 29. Energy Management Services | 12. HVAC Consulting Services | 29. Steven C. Mish Design |
| 13. CBPCA | 30. Environmental Design / Build | 13. ICC, CALBO | 30. The McDermott Group |
| 14. CHEERS | 31. ERH Wst | 14. KB Home | 31. US EPA Region 9 |
| 15. Code Source – Code Green | 32. Erickson Construction | 15. Kn Engineers, Inc. | 32. Wathen-Castanos Hybrid Homes inc |
| 16. CompuCalc | | 16. Meritage Homes | |
| 17. Consol | | 17. PG&E | 33. West Coast Energy Design |

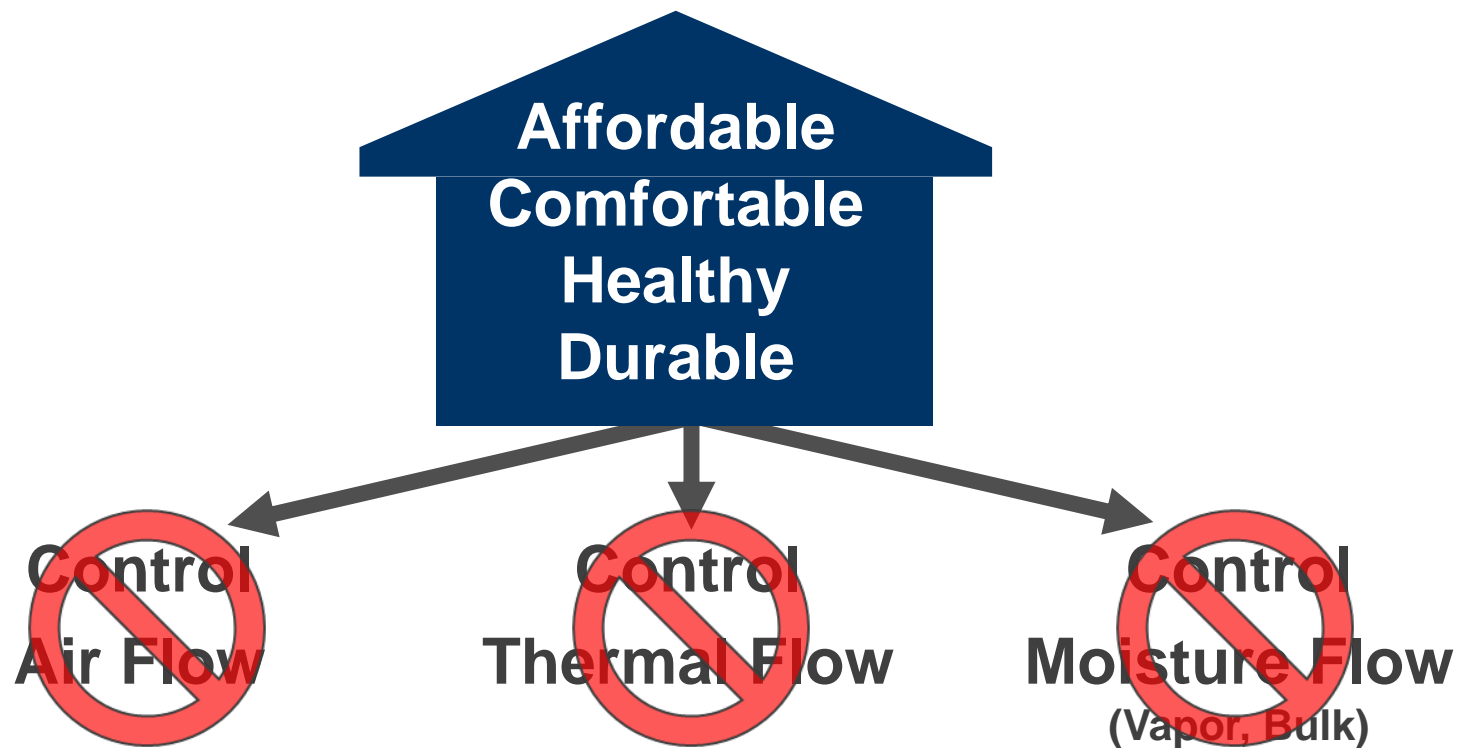




If ENERGY STAR Qualified Homes Version 3 is the Solution...

What's the Problem?

PROBLEM: BUILDING SCIENCE 'PARTS'





← SEAL →

Gap

Void

Compression

Misalignment





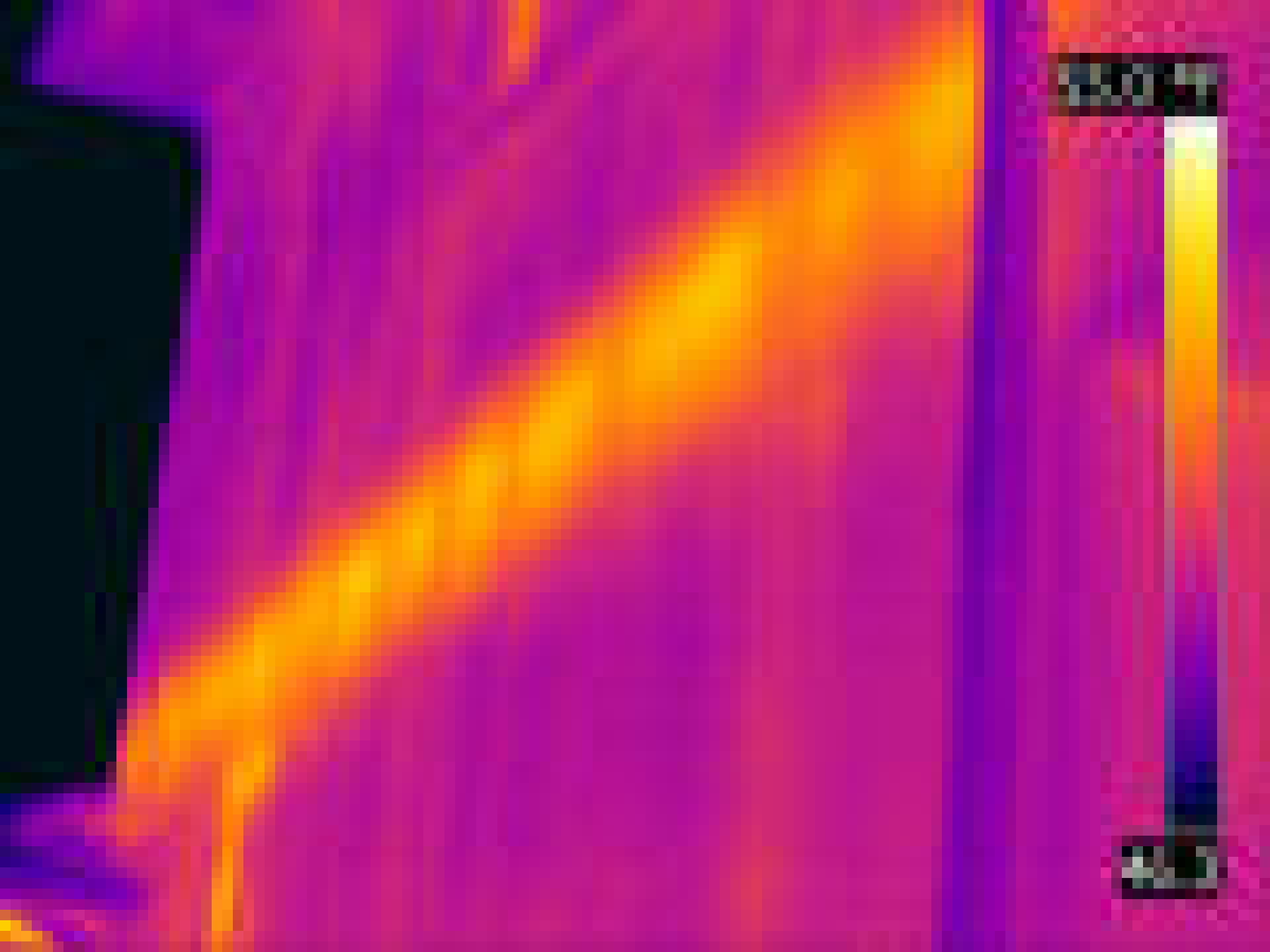
Misalignment

Gaps

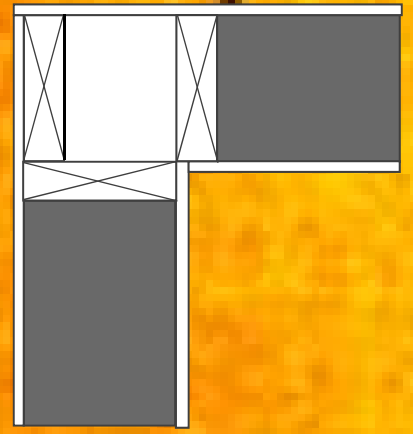
Compression

Voids

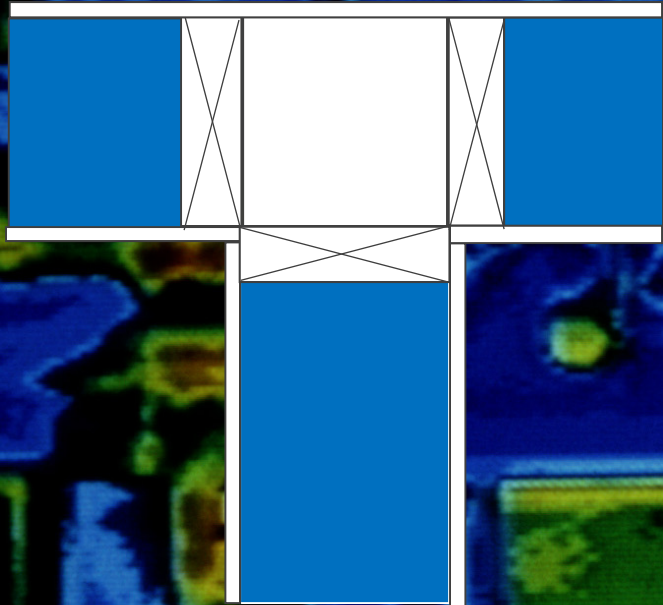
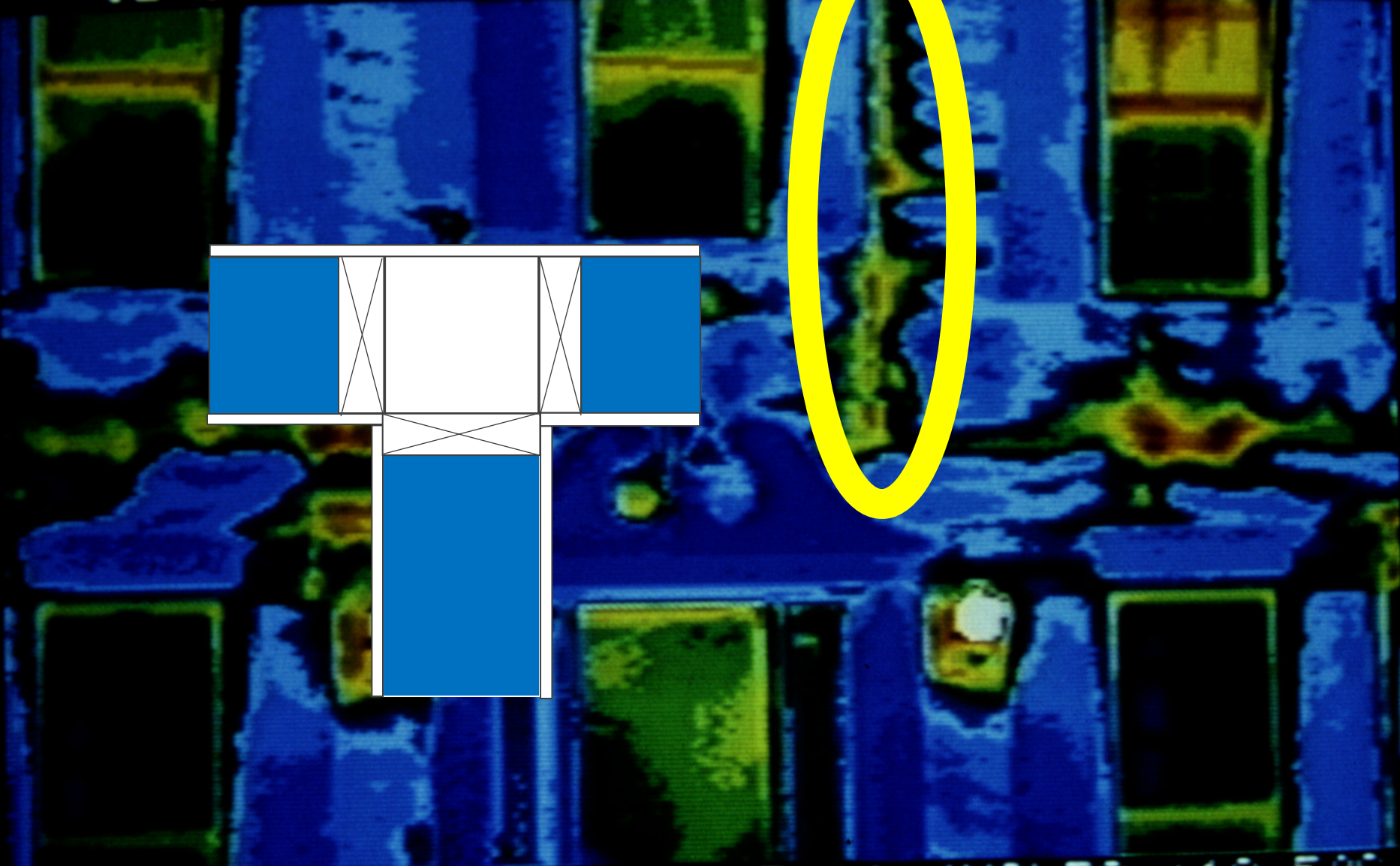






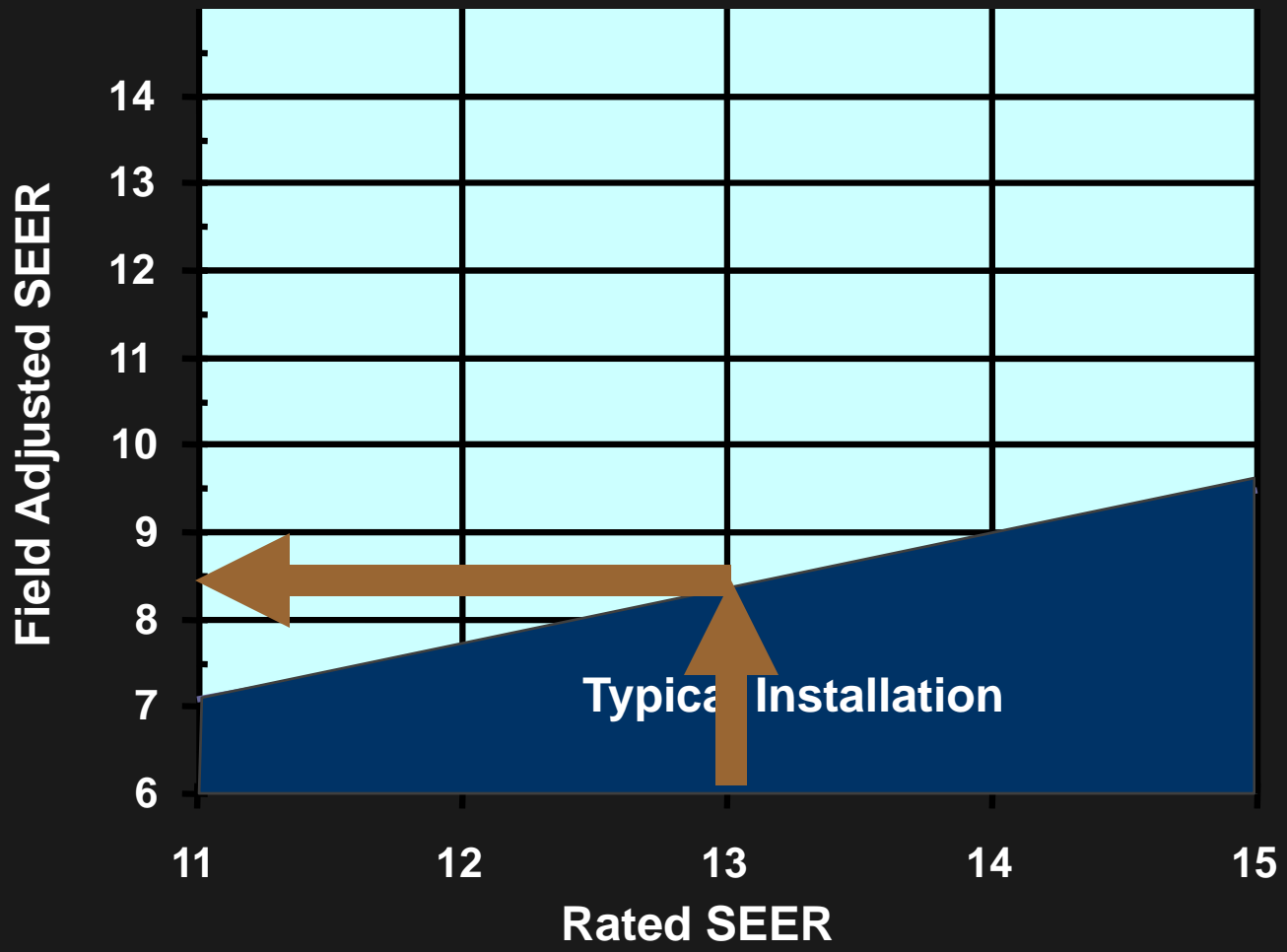


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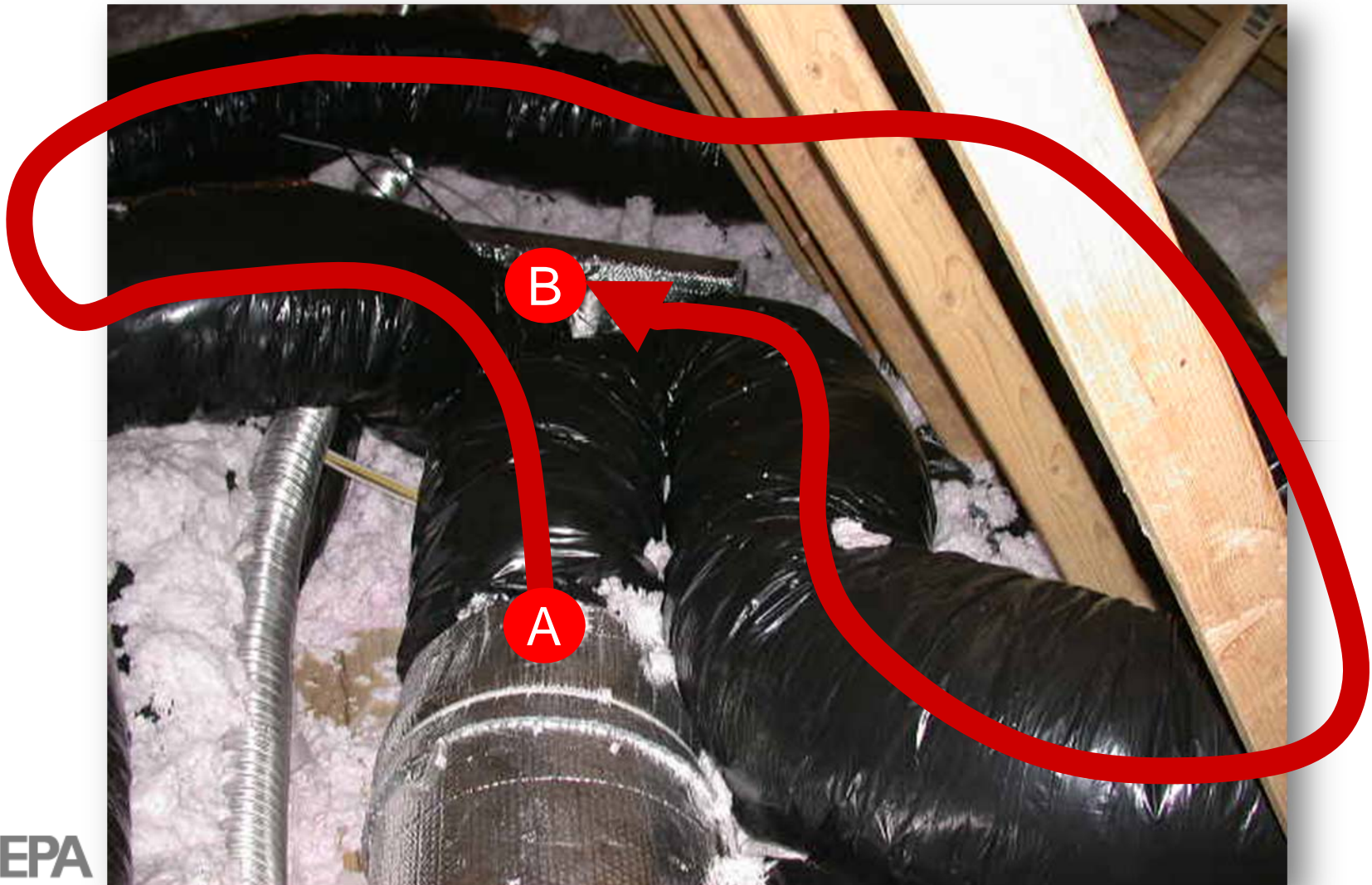


+ 2.5°C IMAGE MODE BAT=11.4VOLTS +12.5°C

HVAC SYSTEM QUALITY INSTALLATION



POOR DUCT INSTALLATION





05.08.2005



della

CLASS 1 AIR DUST
DUST SPREAD
DUST DEVELOPED



UL
CLASS 1 AIR DUST

della

CLASS 1 AIR DUST
DUST SPREAD
DUST DEVELOPED

1952





A photograph of a utility room. On the left is a tall, white cylindrical FAU (Fuel Air Unit) with several labels and a control panel near the bottom. To its right is a silver clothes dryer with a control panel on top and a door on the front. The background is a wall of plywood. A red toolbox is partially visible on the far left. Two white arrow-shaped callouts point to the FAU unit and the clothes dryer.

**FAU
Unit**

**Clothes
Dryer**



**Big
Remaining
Hole!**



**Dryer pulling
flame out of
the heater**

INEFFECTIVE FILTRATION



WHY IS WATER MANAGEMENT SYSTEM ESSENTIAL PART OF ENERGY EFFICIENCY?



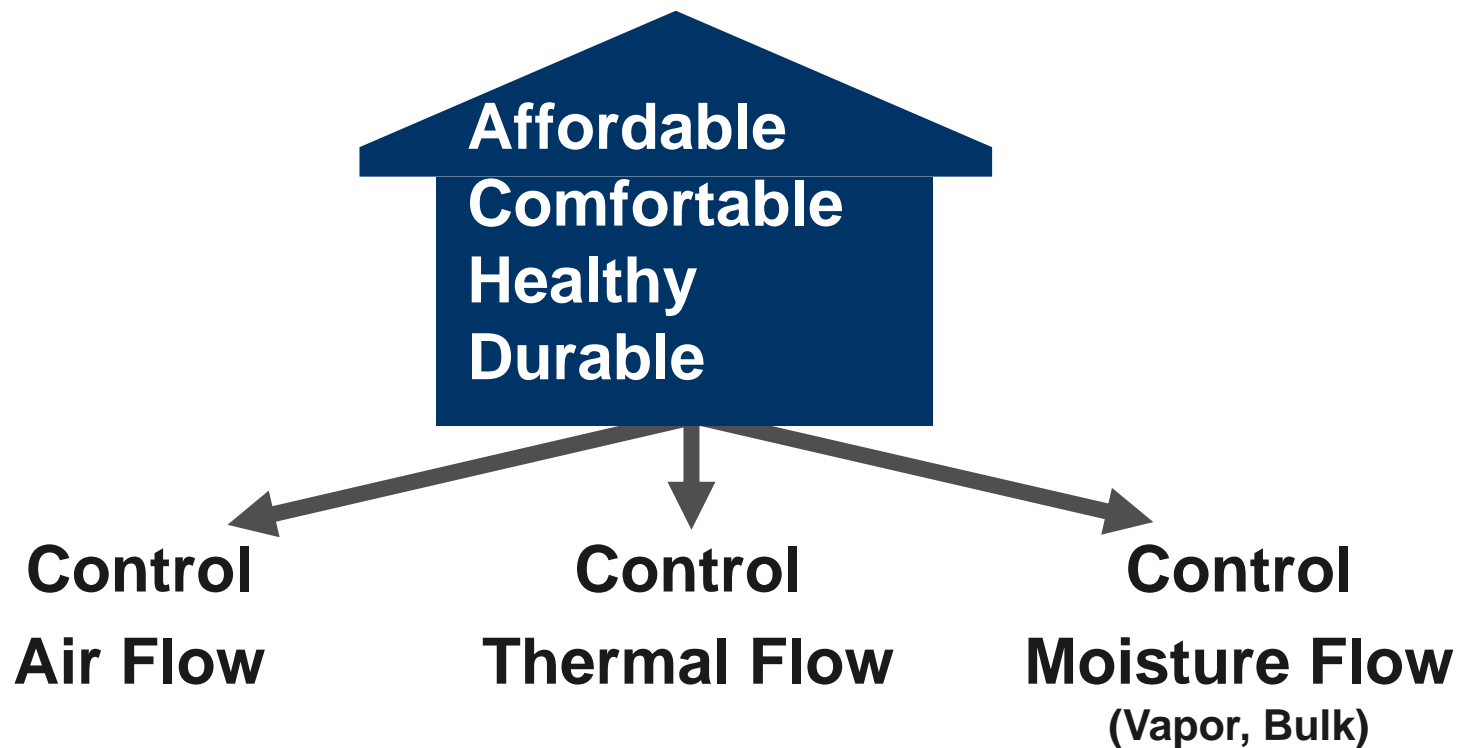








SOLUTION: BUILDING SCIENCE 'SYSTEM'



Defining Energy Efficient



Affordable
Comfortable
Healthy
Durable

Control
Air Flow

Control
Thermal Flow

Control Moisture Flow
Vapor Bulk

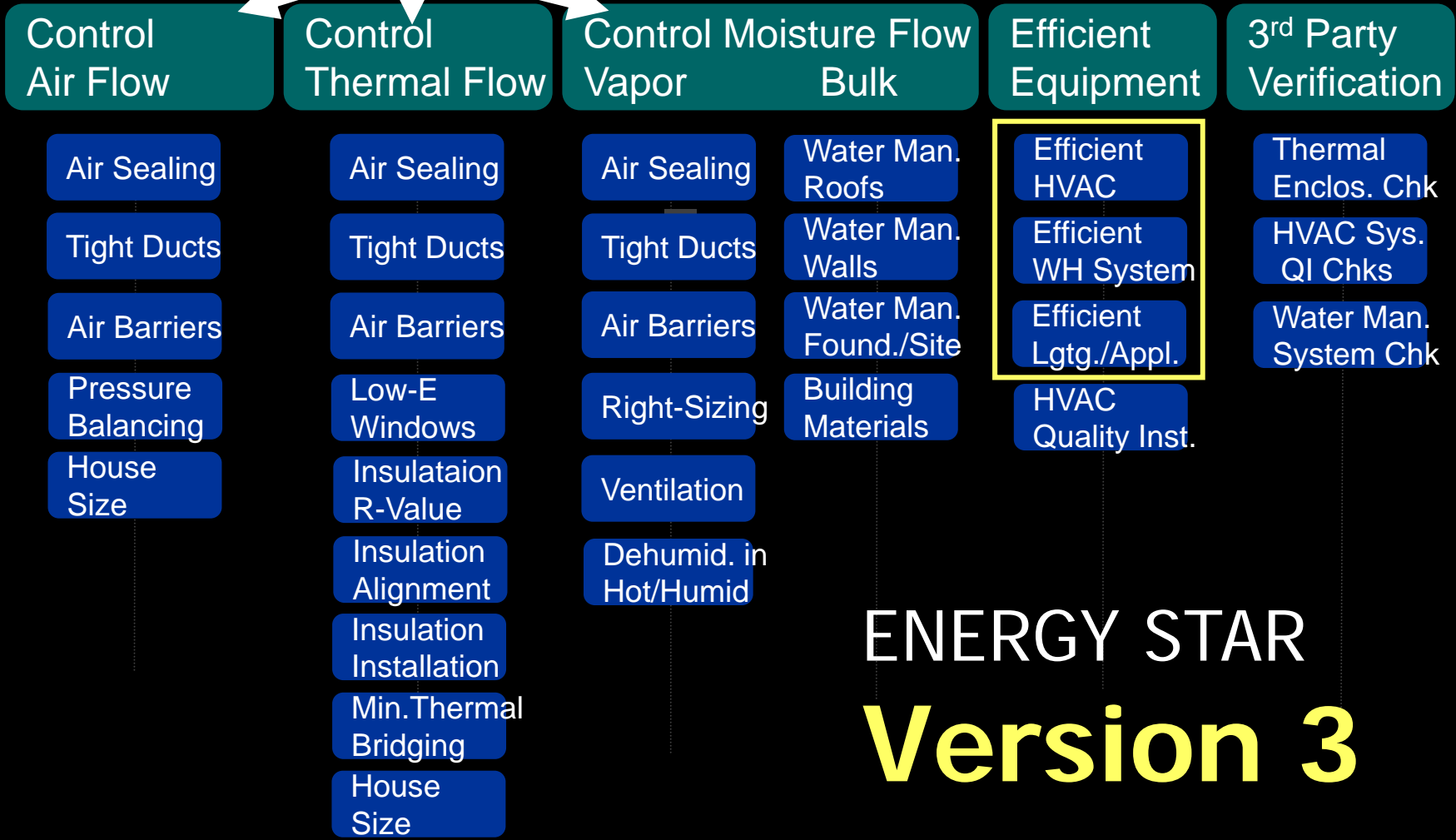
Efficient
Equipment

3rd Party
Verification

Defining Energy Efficient



Affordable
Comfortable
Healthy
Durable



ENERGY STAR
Version 3

ENERGY STAR QUALIFIED HOMES VERSION 3 SPECIFICATIONS



Baseline: Reference Design

- Efficient Htg./Cooling
- Efficient Envelope
- Efficient Components



Mandatory Checklists:

- Thermal Enclosure
- HVAC Quality Installation (2)
- Water Managed Construction

or

Prescriptive*

**Variable HERS
Index**

**Size Adjust.
Factor**

Renewable Energy
Not Allowed for Points

Renewable Energy Allowed
Only for Incremental Points

* Prescriptive Path only allowed for homes \leq Benchmark Home size

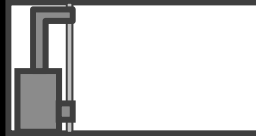
MANDATORY CHECKLISTS

Thermal Enclosure System:



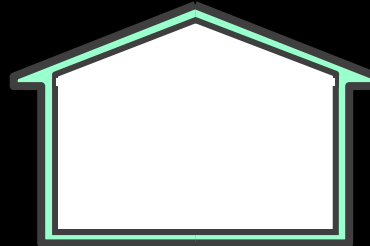
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HVAC Quality Installation System:



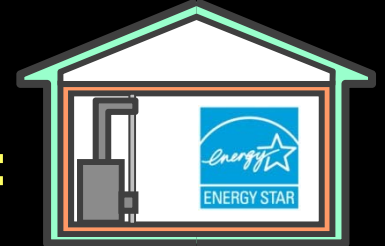
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Water Man. System:



=

Building Science System:



Assured Performance with Every Labeled Home

EPA
Goal for
v3

EPA's Goals for CA ENERGY STAR v3 guidelines



- Similar to goals for Version 3 national program
 - Provide meaningful savings relative to state code (at least 15% improvement)
 - Integrate building-science based checklists:
 - Complete Thermal Enclosure System
 - Quality Design & Installation of HVAC System
 - Complete Water Management System
- Where possible, maintain consistency with structure of national program requirements

Recap of 2010 Stakeholder Meeting



- EPA held stakeholder meeting at 2010 ACEEE Summer Study to gather input on options for CA v3
- Presented comparison of CA Title 24 2008 code requirements to national ENERGY STAR program
- Presented several options for CA v3:
 - Create custom v3 CA ENERGY STAR Reference Design
 - Utilize more aggressive, next-gen 'Concept Home' / ENERGY STAR v4 requirements
- Solicited other ideas from stakeholders

Outcomes of 2010 Stakeholder Meeting



Stakeholders:

- Felt ENERGY STAR still provides value to CA.
- Were amenable to adopting the v3 checklists
- Preferred energy efficiency target $\geq 15\%$ T-24-08
- Asked EPA to develop more detailed draft guidelines based upon feedback.
- Interested in simultaneously adopting a next-gen spec. to promote net-zero ready homes.

Presentation of Draft Guidelines: Key Components



- Only Performance Path option; no Prescriptive Path available in California.
- Savings target defined as at least 15% better than the CA 2008 Building Energy Efficiency Standards.
- Compliance with savings target will be assessed through energy modeling using Title 24 compliant software programs.
- Size Adjustment Factor will be applied for homes larger than the Benchmark Home size.

Presentation of Draft Guidelines: Key Components (cont.)

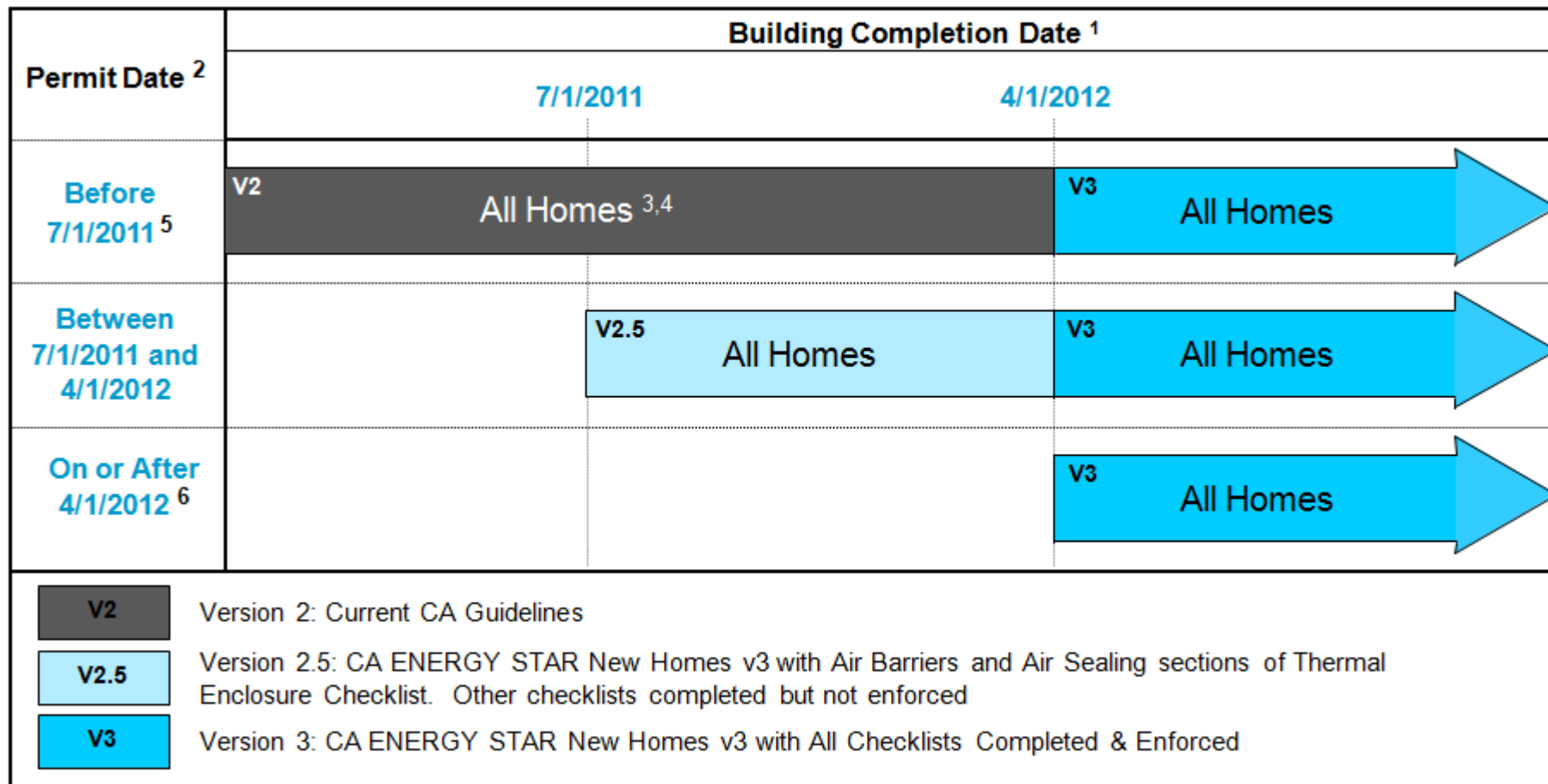


- All ENERGY STAR v3 inspection checklists from the national program will be required in CA:
 - Thermal Enclosure System Rater Checklist
 - HVAC System Quality Installation Contractor Checklist
 - HVAC System Quality Installation Rater Checklist
 - Water Management System Builder Checklist

Presentation of Draft Guidelines: Key Components (cont.)



Proposed CA v3 Implementation Timeline



Illustrative Examples of Compliant Packages

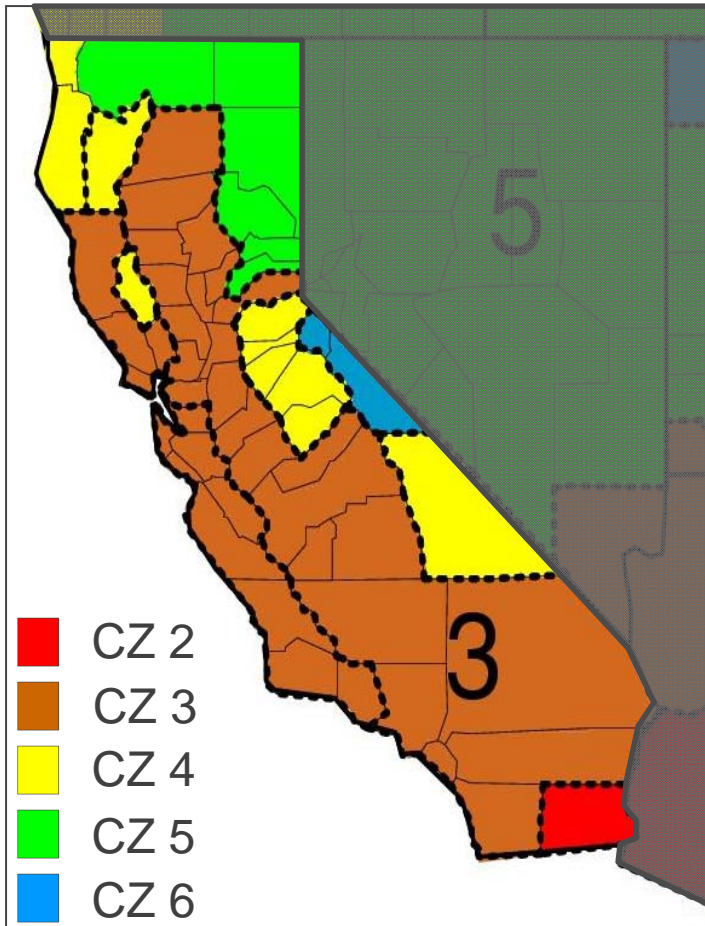


- While compliance will be assessed through energy modeling, representative packages have been developed to illustrate potential upgrades.
- One package prepared for each California-specific climate zone using a Title 24 compliant software program and a home with the following characteristics:
 - One Story, 2,424 ft² of Conditioned Floor Area
 - Three Bedrooms, Slab-on-grade Foundation
 - 15% Window to Floor Area
 - Gas Furnace with Central AC

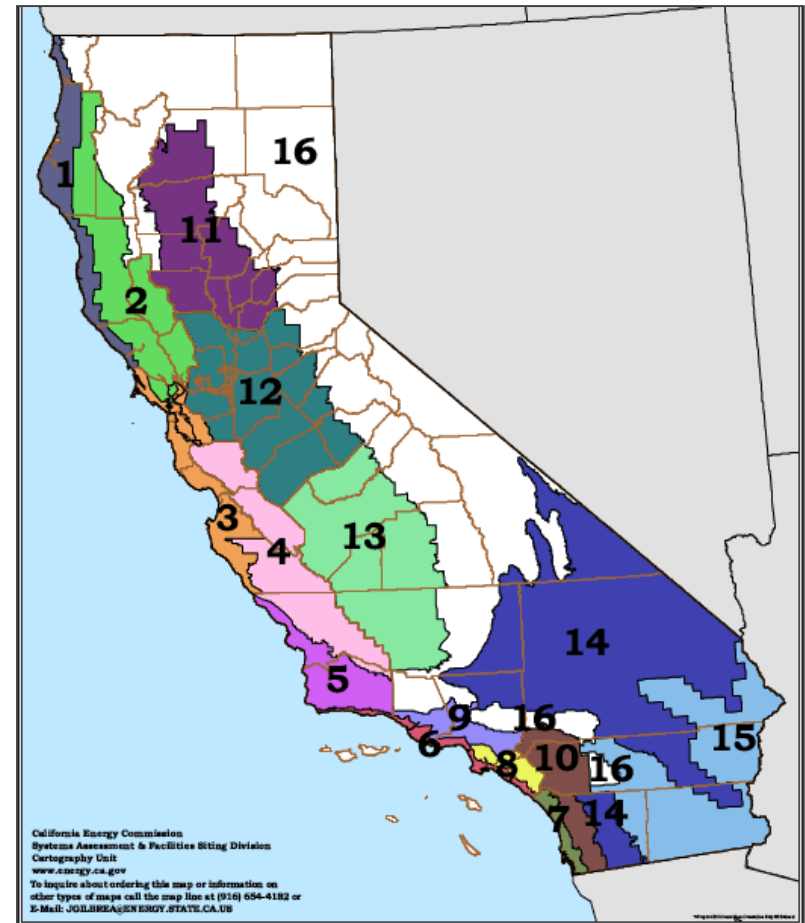
Illustrative Examples of Compliant Packages



2009 IECC Climate Zones



California Climate Zones



Illustrative Examples of Compliant Packages: CA CZ 1-8



Location	Arcata	Santa Rosa	Oakland	Sunnyvale	Santa Maria	Los Angeles AP	San Diego	El Toro
California CZ	1	2	3	4	5	6	7	8
IECC 2009 CZ	5 / 4 M	3	3	3	3	3	3	3
Wall Insulation	21	13	13	13	13	13	13	13
Attic Insulation	49	38	49	38	38	38	30	30
Radiant Barrier	N/A	Required	N/A	Required	Required	N/A	N/A	Required
Window U-factor	0.35	0.40	0.35	0.40	0.40	0.40	0.40	0.40
Window SHGC	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.35
SEER	13	13	13	13	13	13	13	14.5
AFUE	94	80	92	80	90	80	80	80
Water heater EF	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Infiltration (ACH50)	4 ACH50	7 ACH50	5 ACH50	6 ACH50	6 ACH50	5 ACH50	6 ACH50	7 ACH50
Duct Insulation	R-8	R-6	R-6	R-6	R-6	R-6	R-6	R-6
Duct Leakage	4 CFM25	4 CFM25	4 CFM25	4 CFM25	4 CFM25	4 CFM25	4 CFM25	4 CFM25
% Savings over Title 24	16%	16%	16%	17%	17%	16%	15%	17%

Illustrative Examples of Compliant Packages: CA CZ 9-16



Location	Burbank	Riverside	Red Bluff	Sacramento	Fresno	China Lake	El Centro	Mt. Shasta
California CZ	9	10	11	12	13	14	15	16
IECC 2009 CZ	3	3	3	3	3	3	2	3
Wall Insulation	13	13	19	19	19	21	21	21
Attic Insulation	30	38	38	38	38	38	38	38
Radiant Barrier	Required	Required	Required	Required	Required	Required	Required	N/A
Window U-factor	0.40	0.40	0.35	0.35	0.35	0.35	0.35	0.40
Window SHGC	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.40
SEER	13	14.5	14.5	14.5	14.5	14.5	14.5	13
AFUE	80	80	80	80	80	80	80	90
Water heater EF	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Infiltration (ACH50)	7 ACH50	7 ACH50	7 ACH50	6 ACH50	7 ACH50	7 ACH50	7 ACH50	4 ACH50
Duct Insulation	R-6	R-6	R-6	R-6	R-6	R-6	R-6	R-6
Duct Leakage	4 CFM25	4 CFM25	4 CFM25	4 CFM25	4 CFM25	4 CFM25	4 CFM25	4 CFM25
% Savings over Title 24	16%	16%	16%	17%	16%	15%	15%	15%

Explanation of Public Comment Period Process



- The draft CA v3 guidelines are currently available for public comment on EPA's Web site:
http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_v3_california
- The public comment period commences today and will last until March 15, 2011.
- EPA hopes to finalize the CA v3 guidelines in April.
- Please submit all comments and questions to energystarhomes@energystar.gov



Discussion