



**COUNTY OF EL DORADO  
COMMUNITY DEVELOPMENT AGENCY  
DEVELOPMENT SERVICES DIVISION**

2850 Fairlane Ct  
Placerville, CA  
530-621-5315

**MARCH 15, 2017 MINUTES**

**Building Industry Advisory Committee**

- Jerry Homme, Chairman, Member at Large (*Colleen Malone, Alt*)
- Jeff Haberman, Member at Large (*Denny Kennedy, Alt*)
- Bill Carey, Member at Large (*Lori Burne, Alt*)
- Earl McGuire, SAGE (*Garry Gates, Alt*)
- Katie Donahue-Duran, North State BIA (*William Fisher, Alt*)
- Tom Burnette, Building Official (Technical Advisor)
- Marshall Cox, El Dorado Fire (Technical Advisor)

Wednesday, March 15, 2017

1:30 PM

TAC ROOM

*The BIAC makes recommendations to the Board of Supervisors and Development Services Division regarding code interpretations, inspections, procedures, new construction techniques, product review, new codes, revised fees, and other items of industry concern (Resolution 164-2010)*

Members Present: Jerry Homme, Jeff Haberman, Colleen Malone, Bill Carey, Earl McGuire, Katie Donahue-Duran

Members Absent: Garry Gates

Staff Present: Tom Burnette, Don Knight, Michael Elliott, Kyle Krause, April Frace

Guest: John Hidahl

**1. CALL TO ORDER**

The meeting was called to order by Jerry Homme at 1:30 p.m.

**2. ADOPTION OF AGENDA**

Jerry Homme called a vote to amended the Agenda by adding Bob Raymer of the CBIA to speak on Building Energy Efficiency Standards.

Earl McGuire motioned to adopt the Agenda with the above change and adding Jerry Homme to speak after Tom Burnette.

Jeff Haberman seconded.

Ayes: Jeff Haberman, Colleen Malone, Bill Carey, Jerry Homme, Earl McGuire, Katie Donahue-Duran,  
Noes:  
Abstain:  
Absent: Garry Gates

### 3. ADOPTION OF MINUTES DECEMBER 14, 2016

Earl McGuire moved to adopt Agenda. Jeff Haberman seconded.

Ayes: Jeff Haberman, Colleen Malone, Bill Carey, Jerry Homme, Earl McGuire, Katie Donahue-Duran  
Noes:  
Abstain:  
Absent: Garry Gates

### 4. ROGER NIELLO – Community Development Agency Reorganization Discussion

Roger Niello, Interim Director summarized the report dated February 22, 2017 from Don Ashton, Chief Administrative Officer to the Board of Supervisors (see handout).

The report provides information related to the four recommendation in the handout, resulting in the amendment of the Chief Administrative Office and Community Development Agency personnel allocations, and establishing the Department of Transportation, Environmental Management Department, and Planning and Building Department, and resulting in a revision to the existing Community Development Agency model and establishing a shared service model for these functions under the Chief Administrative Office.

After Roger Niello explained the Community Development Agency reorganization, the following occurred:

Roger Niello explained the county's perspective of specific positions versus other jurisdictions and organizational processes. Reorganizing Community Development Agency into 3 new departments consisting of Transportation, Planning and Building (including Long Range Planning) and Environmental Management will be the departments of the Community Development Agency. Administration and Finance become part of Human Resources Department and CAO office. The official changes are effective May 18, 2017.

Discussion ensued.

John Hidahl, Member of the Board of Supervisors spoke in favor of the upcoming changes, effective July 2017.

### 5. BOB RAYMER, Technical Director and Senior Engineer of California Building Industry Association (CBIA)

Bob Raymer explained the mandated 2020 full Zero Net Efficiency will not happen. Obstacles discussed included:

\*Grid not ready for massive amount of renewal energy at 5pm when power is needed most.

\*Cost effectiveness—pays off in year 29 & 30

\*Net Energy Metering-amount of excess energy going to the grid does not have the capability to store and use overgenerated kWhs from PVs

\*State and Federal lack of incentives past year 2020

Handouts to support discussion: 2019 Building Energy Efficiency Standards ZNE Strategy and 2019 BEES Schedule (see attachment)

New construction leans towards 3 story homes, with less roof space for solar and elimination of gas appliances and gas usage. All-electric homes are the goal in the next 10 years. Because of the smaller roofs, off-site solar may be the option.

Discussion ensued.

The California Energy Commission (CEC) will be looking at:

- \*Plug Load Strategy which credits smartphone apps to control usage in your home, and the use of Star Energy appliances.

- \*Attic insulation changes from R-13 to R-19

- \*Window efficiencies to 0.043-0.046 U-factor, currently 0.51

- \*Window U-factor of 0.30, currently 0.32

Bob Raymer discussed important dates on the 2019 BEES Schedule (see handout). May 2018, The California Energy Commission is looking to adopt the Final Express Terms of the 2019 Standards. November 2017; the regulatory proceedings begin.

Discussion ensued.

Jerry Homme asked Bob Raymer, "What can we do as a group to help?" Bob Raymer would appreciate impact analysis costs: R-13 under the eaves, building using 2 x 6 instead of 2 x 4 of a 2 story single-family dwelling using 2100 and 2400 square foot home. Bob Raymer would appreciate ballpark costs.

Earl McGuire suggested a letter from the Board of Supervisors would make an impact.

Tom Burnette suggested the BIAC form a sub-committee to write a factual letter including statistics including cost differential, and impact.

The sub-committee consists of Earl McGuire, Jerry Homme, Kyle Krause, Chris Simonson (volunteered by Tom Burnette) and Jeff Haberman

John Hidahl volunteered to sponsor the BIAC and get the topic on the Board's Agenda.

Earl McGuire motioned to put together a sub-committee to gather stats and make a presentation to the Board of Supervisors, as encouragement and support. Jerry Homme seconded.

Ayes: Jeff Haberman, Colleen Malone, Bill Carey, Jerry Homme, Earl McGuire,  
Katie Donahue-Duran

Noes:

Abstain:

Absent: Garry Gates

**6. TOM BURNETTE – Erosion Control Public Outreach Discussion**

Tom Burnette discussed permit issues on the west slope regarding erosion control. Tom Burnette wants to be proactive in meeting with National Home Builders, to discuss mandates and outreach regarding erosion control.

Discussion ensued.

Tom Burnette asked the committee if there was any interest in participating with setting up meetings, advertising the meetings, and recruitment of attendees (custom home builders, superintendents)

Jerry Homme volunteered his contacts at the Builders Exchange. Katie Donahue-Duran will send a note to her contact group.

The first meeting will take place late this summer.

**7. OLD NEWS – Jerry Homme update**


Jerry Homme spoke with Supervisor Brian Veerkamp, regarding the directives the Board of Supervisors would like BIAC to pursue. Per Brian Veerkamp, the Board of Supervisors will review and give directive through Tom Burnette, to the BIAC.

Fire Code Amendments - The Board of Supervisors adopted the Fire Code Amendments in a 5-0 vote.

**8. OPEN/PUBLIC FORUM****9. NEXT MEETING: June 14 2017 at 1:30 P.M.****10. ADJOURNMENT**

Meeting adjourned at 3:30 pm by executive order.



**Date:** February 22, 2017  
**To:** Honorable, Board of Supervisors  
**From:** Don Ashton   
Chief Administrative Officer  
**Subject:** Community Development Agency Reorganization

**Summary**

This report provides information related to action items 1 through 4, resulting in the amendment of the Chief Administrative Office and Community Development Agency personnel allocations, and establishing the Department of Transportation, Environmental Management Department, and Planning and Building Department, and resulting in a revision to the existing Community Development Agency model and establishing a shared services model for these functions under the Chief Administrative Office.

**Chief Administrative Officer Recommending the Board of Supervisors:**

- 1) Conceptually approve a reorganization of the Community Development Agency to include the following departments: Planning and Building Department, Environmental Management Department, Department of Transportation, and Community Development Services Administration and Finance (Attachment B, page 2).
- 2) Approve and adopt a Resolution (Attachment F) creating new job specifications, bargaining unit designation, and salary schedules for the positions of Director of Transportation, Director of Environmental Management, and Director of Planning and Building (Attachments C, D & E) pending revisions to affected ordinances.
- 3) Approve and adopt a Resolution (Attachment G) amending the Authorized Personnel Allocation adding a Deputy Chief Administrative Officer, Director of Transportation, Director of Environmental Management, and Director of Planning and Building and deleting the Director, Community Development Agency, Assistant Director, Community Development Agency, Transportation Division Director, Environmental Management Division Director, Development Services Division Manager and one Principal Administrative Analyst position, resulting in reductions in force effective July 1, 2017, pending revisions to affected ordinances.
- 4) Direct staff to revise and update Chapter 2 of the County Code to reflect the changes in organizational structure and designate appointed department heads pursuant to Section 404 of the Charter of the County of El Dorado, and return to the Board for adoption of affected ordinances and any required resolutions within 45 days.

## **Background**

On December 19, 2011, the Board received and filed the Organizational Review Report for the Department of Transportation and approved the CAO's proposed Action Plan to address the issues highlighted in that report as well as other Board priorities, which included establishing a Facilities Management function within the CAO's Office and investigating the feasibility of forming a Community Development Agency.

Following a series of hearings on the matter, on November 13, 2012, the Board of Supervisors approved the reorganization of the Department of Transportation, Environmental Management Department, and the Development Services Department into a single Community Development Agency (CDA). This action made a number of organizational changes, including the addition of a Community Development Agency Director position, an Assistant Agency Director position, and an Assistant Director of Finance Administration position, totaling approximately \$675,000 in additional costs, effective December 5, 2012. The creation of CDA was intended to accomplish the following objectives:

1. Provide a unified leadership structure that maximizes opportunity for programmatic and operational synergy;
2. Streamline and simplify processes for customers;
3. Improve customer service by increasing interaction and coordination between department functions and staff;
4. Provide for succession planning by developing cross-functional teams;
5. Provide for cohesive, well-integrated long-term planning; and
6. Consolidate administrative and fiscal functions, including grants, contracts, and IT support.

Recently, the CAO, in conjunction with the Interim CDA Director, explored options that could ensure the continued coordination and collaboration within the CDA to further accomplish the original objectives identified above, but under a more cost effective organizational structure. Based on that assessment, the CAO is recommending the reorganization of the CDA, as described below. If approved by the Board, staff will return to the Board at a later date with the necessary changes to Title 2 of the El Dorado County Code of Ordinances, Administration and Personnel, and any necessary resolutions for implementation of the re-organization.

## **Proposed Organization Structure**

The reorganization transitions the combined CDA to three major Departments: Transportation, Environmental Management, and Planning and Building, and maintains the Administration and Finance function with the agency functioning under a shared services model.

The proposed organization structure provides for the oversight and governance of the functions of Transportation, Environmental Management, Development Services, and Long Range Planning. As



proposed, the Department Heads over Transportation, Environmental Management, and Planning and Building would continue to report to the Board of Supervisors as defined in the County Charter. The proposed organization structure reinforces the intent of the Board of Supervisors that the Chief Administrative Officer exercise overall responsibility for the coordination of department activities to ensure the sound and effective management of County government consistent with County Ordinance 2.13.005. Each department would report directly to a Deputy CAO in a shared services model.

Additionally, as identified in the organization charts (Attachment B), the proposed structure will provide the Chief Administrative Office with more authority over these departments' administrative and fiscal responsibilities. The shared services model for administration and finance would permit the CAO to perform common administrative or fiscal operations for all departments. This is similar to the approach currently used for other County departments, including the District Attorney, Public Defender, Information Technology, and Clerk of the Board.

Employing a shared services model for programmatic management as well as administration and finance is intended to improve communication and reduce fragmentation, overlap, duplication, and overall costs through standardization and continual process improvements.

The Directors over Transportation, Environmental Management, and Planning and Building would report to the Chief Administrative Officer through a Deputy CAO on day-to-day operations, but would maintain autonomy and accountability for programmatic recommendations to the Board of Supervisors as the subject matter experts for their respective departments.

#### Challenges of the CDA Model

Former and current management from within CDA have advocated that maintaining the functions of CDA under one authority is the most effective model. While the concept of uniting the Transportation Division, Development Services, Long Range Planning, and Environmental Management under one centralized agency in order to improve collaboration and service delivery is well-founded, it is essential that the County attempt to meet these objectives in a more cost-effective manner. The proposed structure retains the benefits of the CDA model, while improving fiscal and administrative accountability and cost efficiency.

It should also be noted that both the current Interim CDA Director and the previous CDA Director reached the conclusion that the roles of the Development Services Division Director and the Assistant Director of Community Development are redundant, primarily because the original concept of the new structure was never fully implemented. Specifically, the Assistant Director of Community Development, as identified in the job specification, was tasked with having significant responsibility for the development, implementation, oversight, and evaluation of Community Development Agency programs, services, and functions and is responsible for managing day-to-day activities of the agency through subordinate managers. However, in practice, this position was solely responsible for Long Range Planning, and never assumed organization-wide responsibility over areas such as transportation, environmental management, and development services. Therefore, the proposed new organizational structure has been developed, in part, to resolve this redundancy and to better define the management of Long Range Planning efforts and the management of CDA as a whole.

Additionally, due to the resultant size of the CDA following the 2012 reorganization, there has developed a sense that the major functions within the agency have become too far-removed from

administrative and policy oversight and direction, namely from the CAO and the Board. As discussed above, the proposed new organizational structure has been developed to ensure more direct communication and oversight with the CAO and the Board.

Finally, the County has a responsibility to ensure that its services are being provided in the most efficient manner possible. The need to take advantage of available cost-saving opportunities has become even more critical in the past few months. Fiscal challenges facing the County include increasing CalPERS costs and changes recently recommended in the Governor's proposed budget, as well as the recognized need for resources to fund county infrastructure needs including buildings, roads, and information technology. A review of the CDA and its finances has shown that services could be delivered in a more cost-effective manner, with no impact to the individual departments. As indicated above, when CDA was created, the County added three executive level management positions totaling approximately \$675,000 in additional costs each year. Due to the fiscal challenges facing the County, it is essential that a more efficient model be implemented while maintaining cohesiveness between departments and a high level of accountability to the Board. The proposed organizational structure accomplishes this.

#### Benefits of Proposed Structure

This reorganization would centralize authority within the CAO's office, while recognizing the subject matter expertise and accountability of the department/division directors, and increasing cost-efficiency.

The proposed organization structure allows greater CAO management authority of the functions of CDA, consistent with County Ordinance 2.13.005, which stipulates that the Chief Administrative Officer exercise overall responsibility for the coordination of department activities to ensure the sound and effective management of County government. The proposed organizational structure would include Board-appointed department heads, with the authority of the CAO's Office during day-to-day operations. The more active role of the CAO in the administrative functions of CDA should ensure a higher degree of transparency relative to finance and administrative matters.

Under this structure, the new positions would manage the prospective departments and report to the CAO under the direction of the new Deputy CAO position. The roles of the Division Directors of Transportation, Environmental Management, Development Services, and Administration/Finance and the need for leadership for Long Range Planning matters are all crucial to the mission of CDA. The nature of the work associated with these departments requires experts in the prospective fields as well as collaboration on projects and a unique set of fiscal considerations. These characteristics necessitate specialized attention for each subject, which would be provided under the directors for each department. With the proposed changes to the organizational structure, the Division Director positions would revert to the pre-2012 job specifications for management of the individual departments.

Additionally, due to several recent vacancies, the Community Development Agency Director and the Community Development Agency Assistant Director positions are not presently filled by permanent employees. The role of Director is currently filled by an interim director. The Assistant Director position is currently filled by a Principal Planner in an acting role, and this individual has noticed the department of her resignation effective in March 2017. The proposed reorganization comes at a time when the resulting reduction in force would not result in the termination of employment of individuals filling those top-level positions.



Fiscal Impact

As mentioned above, the proposed organizational changes would also result in considerable cost savings. The proposal includes the deletion of two of the highest level of management positions: the Director of CDA and the Assistant Director of CDA. It also includes the deletion of one Principal Administrative Analyst position in the CAO's Office. A Deputy CAO position will be added to maintain cohesive management of the CDA functions and to oversee all administrative, finance, and policy matters.

Department Director Restructure Fiscal Impact, Salary plus Benefits:

- Delete Director, Community Development Agency position: (\$274,000)
- Delete Assistant Director, Community Development Agency position: (\$214,000)
- Delete one Principal Administrative Analyst position: (\$164,000)
- Add Deputy CAO position: \$205,000

Net Annual Cost Reduction: (\$447,000)

The current Division Director positions for Transportation, Environmental Management, and Development Services would also be deleted and replaced with Department Director positions. The salaries are not proposed for change at this time, as there were no decreases in salaries at the time that CDA was created and the At-Will (Board Appointed) Department Director positions became Civil Service Classified Division Director positions. Should recruitments for the positions prove unsuccessful, an increase in salaries could be enacted at a later date. This proposal contemplates assigning responsibility for Long Range Planning activities to the Development Services Department, and retitling that that Department "Planning and Building". This change would eliminate the redundancy between the current Development Services Division Director position and the Long Range Planning management responsibilities of the current Assistant Director, CDA position.

Division Director Restructure Fiscal Impact, Salaries plus Benefits:

- Delete Transportation Division Director: (\$203,000)
- Delete Environmental Management Division Director: (\$203,000)
- Delete Development Services Division Director: (\$203,000)
- Add Director of Transportation: \$203,000
- Add Director of Environmental Management: \$203,000
- Add Director of Planning and Building: \$203,000

Net Annual Cost Increase: \$0

Strategic Plan

The recommended action contributes to the achievement of Strategic Plan Goal 2: Good Governance: Achieving the best possible process for making and implementing decisions in accordance the county's

core values, legal requirements, and industry best practices. Specifically, this recommendation would contribute to Objectives 2.2, and 2.3.

Objective 2.2 is, "Review and update policies related to inter-office services and public services. Establish a mechanism for timely updates, review for relevance to ensure a balance between appropriate level of internal control and efficient work flow." The proposed reorganization of the Community Development Agency would centralize administrative and fiscal functions within the CAO, while maintaining the autonomy of each department based on subject matter. This serves to consolidate matters affecting all development-related departments providing opportunities for increased communication between offices, and unique policies and management within departments. The recommended action would contribute to Objective 2.2 through the enhanced structure of the development-related departments.

Objective 2.3 is, "Identify and implement 'best practices' within central support departments, and develop service level standards of central support departments/divisions/programs for the purpose of continuous service improvement as well as establishing a framework for improved communication and customer engagement." The proposal retains the benefits of collaboration and streamlining services first envisioned with the Community Development Agency model, while improving fiscal and administrative accountability and creating cost-efficiency. The recommended action would also contribute to Objective 2.3 through the centralization of administrative and fiscal functions within the CAO, providing for continual evaluation of service standards and cross-subject best practices.

### **Recommendation**

The CAO's office is recommending approval of action items 1 through 4 at this time in order to allow for a recruitment to fill the new Deputy CAO position prior to the departure of the current Interim Director of CDA.

DA:da

Attachments

Cc: Roger Niello, Interim CDA Director

# 2019 BEES Schedule



2019 STANDARDS UPDATE SCHEDULE	
DATE	MILESTONES
August 2016 to April 2017	Stakeholder-hosted workshops & proposal development
January 2017-March 2017	Second round of Stakeholder-hosted workshops & proposal development
<b>April 2017</b>	<b>DRAFT Code proposals (CASE Reports) submitted to the CEC</b>
June 2017	Pre-rulemaking Draft Express Terms prepared, made available for public comment
<b>June 2017</b>	<b>FINAL Code proposals (CASE Reports) submitted to the CEC</b>
July 2017	Incorporate public comments into Draft Express Terms; prepare Notice of Proposed Action (NOPA) and Initial Statement of Reasons (ISOR)
September 2017	File Draft Express Terms, ISOR, NOPA with CBSC
November 2017	Draft Express Terms, ISOR, NOPA published; 45-day Public Review Period begins
November-December 2017	Host 45-day Language Hearings
January 2018	End of 45-day review/comment period; begin review of submitted comments and preparation of 15-day language
February 2018	Publish 15-day language; begin 15-day Public Review Period
May 2018	Adopt Final Express Terms of the 2019 Standards at Business Meeting
June 2018	Begin updating Software, Compliance Manuals, Electronic Documents
July/August 2018	CBSC Code Advisory Committee Meeting-CalGREEN
September/October 2018	Adoption CalGREEN (energy provisions) at Business Meeting
November 2018	Deliver Final Rulemaking Package to CBSC; Approve updates to Compliance Manuals
December 2018	CBSC Approval Hearing
January 2019	Make Software, Compliance Manuals, Electronic Documents Available to Industry
January 1, 2020	Effective Date of 2019 Building Energy Efficiency Standards (Title 24, Part 6)





# Building Energy Efficiency Standards

## 2019 Building Energy Efficiency Standards ZNE Strategy

Building Standards Office:

**Mazi Shirakh, PE**

ZNE Technical Lead

**Christopher Meyer**

Manager, Building Standards Office

**Bill Pennington**

Senior Technical and Program Advisor to the  
Energy Efficiency Division

**COUNTDOWN TO 2020**

**February 9, 2017**

# ZNE Standards: the 2015 IPER Vision



A decade ago when the ZNE goal was first set it was a simple idea: All newly constructed residential buildings by the year 2020 must be ZNE as defined by the IEPR:

“...the value of the **net amount of energy produced by on-site renewable energy resources is equal to the value of the energy consumed annually by the building**, at the level of a single “project” .... using the California Energy Commission’s **Time Dependent Valuation** metric.”

Improving building energy efficiency and deploying PVs were identified as the primary tools to achieve the ZNE goals





# ZNE Goals – Lessons Learned



Reality turns out to be more nuanced - Since ZNE policy was first set we have learned about the impact of

- large scale PV deployment on the grid resulting from the **50% RPS**,
- large scale deployment of **building-based PVs** which **lowers the value of additional electricity around midday**, coincident with utility solar production
- Impacts of net energy metering (**NEM**) and Time-Of-Use (**TOU**) on **compensation for residential customer-owned generation and cost effectiveness of PVs**

Also, we have learned that as the **electric grid becomes greener** in the future, **rooftop PVs will have diminished carbon reduction benefits**







# ZNE Goals – Lessons Learned - Continued

- The current NEM rules treat the grid as “**virtual storage**” (or a bank), where the overgenerated kWhs can be “stored” and retrieved later in the day, or even as if summer kWhs could be stored until winter
- In reality, the **grid as it is now has very little capability** to store and effectively use overgenerated kWhs from PVs
- **Electrification of homes**, which results in a larger PV array, must be coupled with **grid harmonization strategies** to avoid aggravating the duck curve issues and to realize the expected environmental benefits
- Currently, customer-owned storage at about \$450/kWh is still too expensive to be cost effective using the LCC for the 2019 Standards, but this is a fast evolving technology which can become cost effective under a future cycle of the Standards



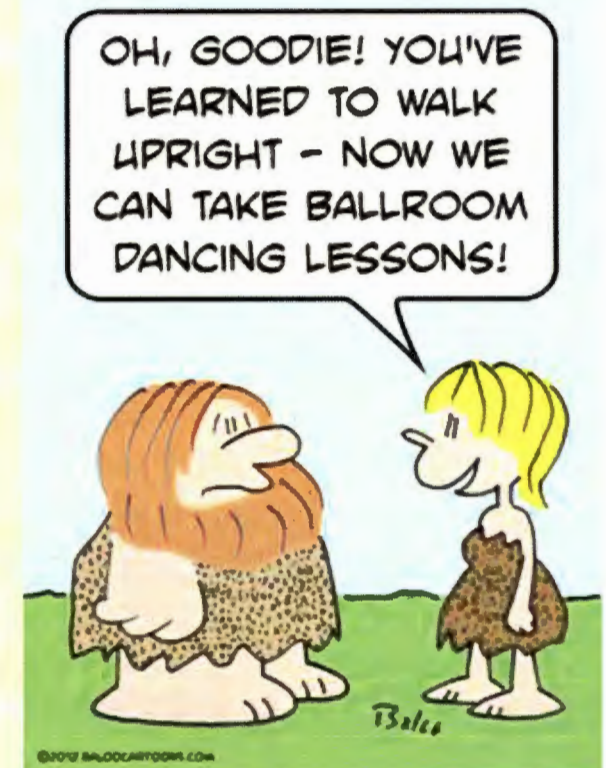
# ZNE Goals – Lessons Learned - Continued



The most important lesson is that within a few years, perhaps by 2025, because of reduced value of solar PV around midday, **customer owned PV systems must be coupled with effective grid harmonization strategies (GHS), such as storage, demand flexibility, and EV integration to bring maximum benefits to the grid, environment, and the home owner**

**GHSs are strategies that maximize self-utilization of the PV array output and minimizes uneconomic exports to the grid**

the 2019 Standards approach must consider these issues







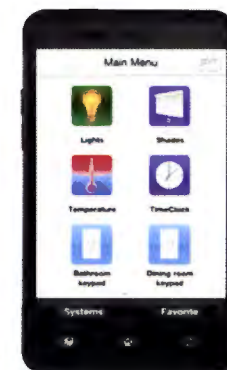
# ZNE Goals – 2019 Standards Goals

The 2019 Standards should be structured to **send the right signal to the market** to pave the way for achieving full ZNE in a later cycle of Standards by encouraging:

1. Envelope efficiency, 2. Appropriately sized PVs, and 3. Grid harmonization and EV integration strategies that maximize self-utilization of the PV output and limit exports to the grid

Further, the standards must be framed in a way to **encourage competition, innovation, and flexibility** to foster new solutions as the grid and technologies evolve.

A possible structure is proposed later in the presentation.

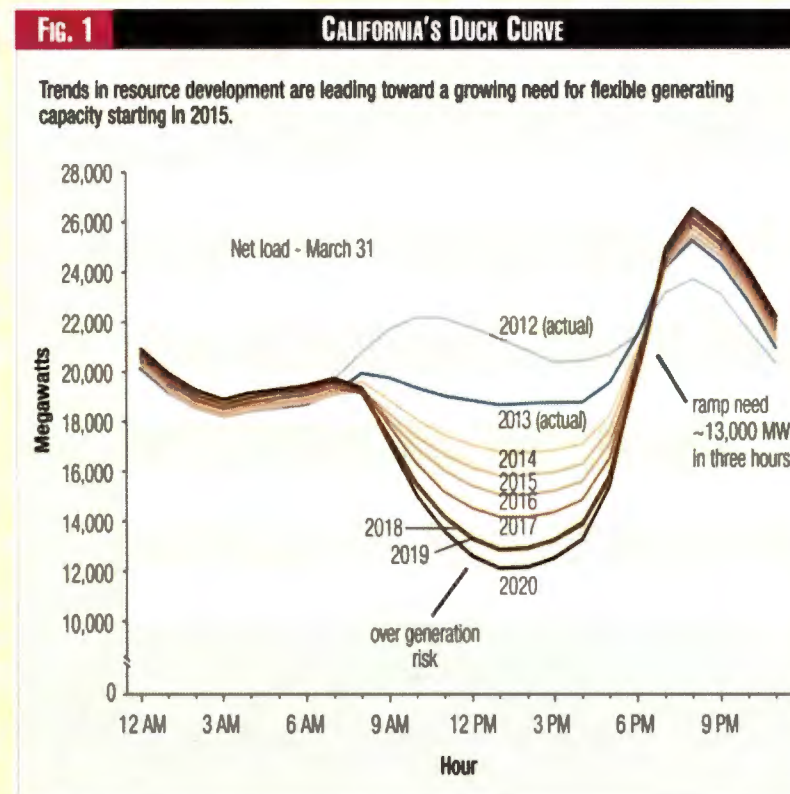


# The ZNE Challenge: Grid Harmonization



The value of midday PV generated kWhs decrease as we approach the 50% Renewable Portfolio Standard (RPS) by 2030 and increasing customer-owned renewables; this necessitates developing GHS strategies that prevent the so called "Duck Curve" Issues

However, Hawaii and Australia that have already encountered these problems, are adopting grid integration/harmonization strategies to maximize self-utilizations and minimize exports to the grid







# PV Cost Effectiveness - Findings

All Standards measures , whether efficiency or renewables, must be cost effective in each CZ, using life cycle costing

Using the 2019 TDVs which captures the impact of 50% RPS by 2030, the LCC finds:

**Appropriately sized PVs that displace the site kWh are found to be cost effective in all climate zones, even if the NEM2 rules are changed to compensate exported kWhs at wholesale - even assuming no Federal ITC**



# Proposed 2019 Standards Approach



1. Maximize envelope efficiency as allowed by LCC and calculate EE EDR
  - i. HPA to R19 in severe CZs – Currently R13
  - ii. HPW to 0.043 ~ 0.046 U-factor in severe CZs – Currently 0.051
  - iii. Windows U-factor of 0.30 and SHGC of 0.23 – Currently 0.32 and 0.25
  - iv. QII as a prescriptive requirement
2. Establish an Energy Design Rating (EDR) for energy efficiency in each CZ **that can only be met with efficiency measures (no PV tradeoff against EE)**

Calculate EDR of PV array as follows:

3. Calculate the PV size required to displace the site kWh in each CZ
4. Calculate the EDR contribution of the PV array
5. Combine the EDR contribution of EE to the EDR contribution of PV and **establish a Target EDR in each CZ that the building must meet to comply**

*Note: Examples are presented in later slides*





# Target EDR's Many Advantages

1. A target EDR establishes a **performance benchmark that the building must meet to comply**; the concept is a modern version of California's **performance standards** consistent with the Warren-Alquist Act expectation to provide builders with compliance flexibility
2. As shown by the **2016 HPA and HPW approach**, builders appreciated **having many options to comply**, leading to a flurry of **innovation in attics and walls**, which continues to date
3. Similarly, the target EDR if **structured correctly**, can send the **right signals to the market about EE, PV sizing, demand response and flexibility**, and other options that can achieve ZNE in the future
4. Target EDR allows the builder to **use more efficiency and less PV to get to the target**; the builder can also **use appliances that are higher than minimum efficiency levels** that we are prevented to require because of preemption
5. Target EDR can provide **credit for demand response and flexibility, storage, EV integration, and other grid harmonization strategies** that can achieve full ZNE in the future
6. Target EDR is fully **compatible with the reach codes**, local jurisdiction simply identify a lower target EDR (or zero) that can be met with a combination of additional EE, PV, demand response/flexibility, EV integration, or storage
7. Target EDR works well with **varying building sizes** – static PV size does not

# Target EDR Advantages - Example



Here is an example of how CBECC calculates the Target EDR for both EE and PV in CZ12 for the 2,700 sf house:

2016CZ12\_2700ft2 - CZ12 STD2700 EGLASS20 2016PKG

Energy Use Details | Summary | Energy Design Rating

EDR of Proposed Design:     EDR of Proposed PV+Battery:     Final Proposed EDR:

EDR of Standard Design:

End Use	Reference Design Site (kWh)	Reference Design Site (therms)	Reference Design (kTDV/ft <sup>2</sup> -yr)	Proposed Design Site (kWh)	Proposed Design Site (therms)	Proposed Design (kTDV/ft <sup>2</sup> -yr)	Design Rating Margin (kTDV/ft <sup>2</sup> -yr)
Space Heating	568	472.4	43.85	176	204.7	18.41	25.44
Space Cooling	1,687		58.92	355		20.18	38.74
IAQ Ventilation	141		1.45	141		1.45	0.00
Other HVAC			0.00			0.00	0.00
Water Heating		176.3	13.03		121.9	9.01	4.02
Photovoltaics				-4,870		-46.97	46.97
Battery						0.00	0.00
Inside Lighting	2,615		30.28	616		6.95	23.33
Appl. & Cooking	989	73.4	15.65	1,041	45.1	14.45	1.20
Plug Loads	3,267		35.03	2,371		25.01	10.02
Exterior	328		3.52	152		1.61	1.91
<b>TOTAL</b>	<b>9,595</b>	<b>722.1</b>	<b>201.73</b>	<b>-19</b>	<b>371.8</b>	<b>50.10</b>	<b>151.63</b>

Done





# Target EDR Examples by Climate Zone

Here is an example of how Target EDR might look for different CZs for PVs sized to displace site kWhs for the 2,700 sf house:

*Note: At this time these numbers are examples only and may change as our tools evolve*

CZ	Efficiency EDR without PV, based on 2019 Efficiency Measures	Target Design Rating Score for Displacing kWh Elect with PV	kW PV Size for Displacing kWh Electric Only
1	55.7	31.5	3.4
2	41.2	18.0	2.9
3	45.6	20.4	2.8
6	47.6	17.6	2.8
7	48.0	13.9	2.7
8	43.0	14.6	2.9
11	43.2	20.7	3.8
12	43.2	22.2	3.1
13	44.8	22.1	4.0
14	44.6	21.3	3.3
15	48.0	17.9	5.7
16	48.9	29.6	2.8

# All-Electric Home Option



**What should be the EE EDR and Target EDR for All-Electric Homes (AEH)?** Staff proposes the same EDRs used for mixed fuel homes be used for the AEH:

1. Requiring a much larger PV system on AEH to displace the larger annual kWh will disincentivize the AEH approach
2. The larger PV needed to displace the AEH kWh, without grid harmonization strategies, will aggravate duck curve issues

Large number of AEHs, due to higher winter kWh usage than summer, can cause a winter peak that may be as large or larger than the summer peak with limited solar resources in the winter to help.

2016 - 2,700 sf	All-Electric Home Challenge	
	Summer Cooling kWh	Winter Heating kWh
CZ		
1	0	4,686
2	30	2,367
3	3	932
7	9	139
8	302	307
11	1,577	2,179
12	543	2,208
13	1,757	1,868
14	1,578	2,266
15	5,282	119
16	105	5,596
<b>Total</b>	<b>11,186</b>	<b>22,667</b>





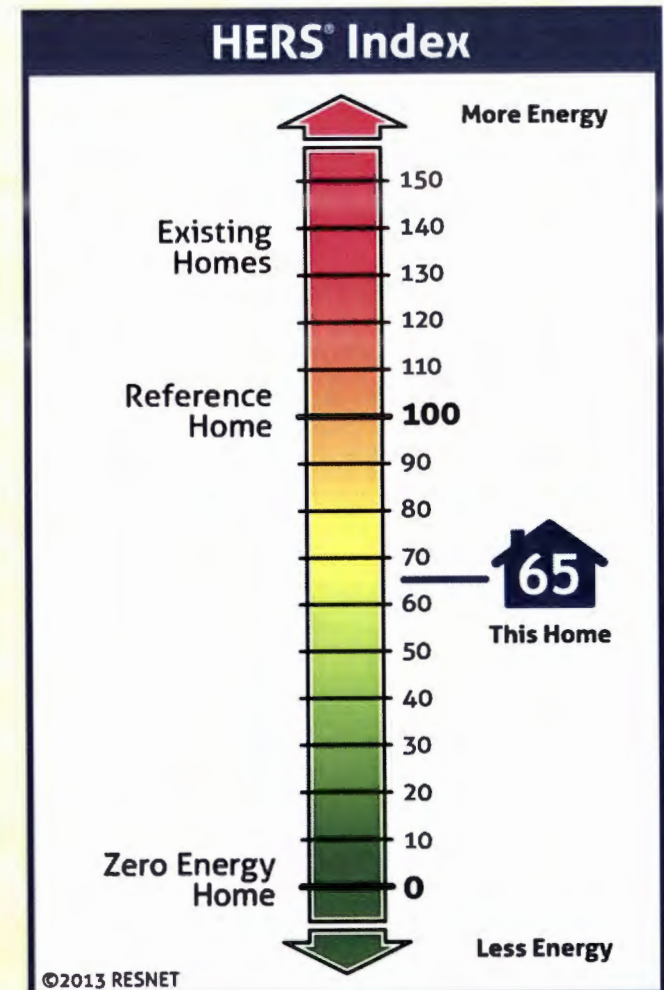
# Builds on Commission's Energy Design Rating Tool



- Energy Design Rating (EDR) score show how close a home is to the ZNE target
  - Aligned with RESNET
  - Reference home is a 2006 IECC compliant home, EDR=100
  - A score of zero means the house is a ZNE building
- CEC's CBECC-Res software has the capability to calculate EDR scores for EE and PV
- Builders can use a combination of envelope energy efficiency features, better appliances, PVs, and other strategies to get to the target EDR

Download CBECC-Res here for free:

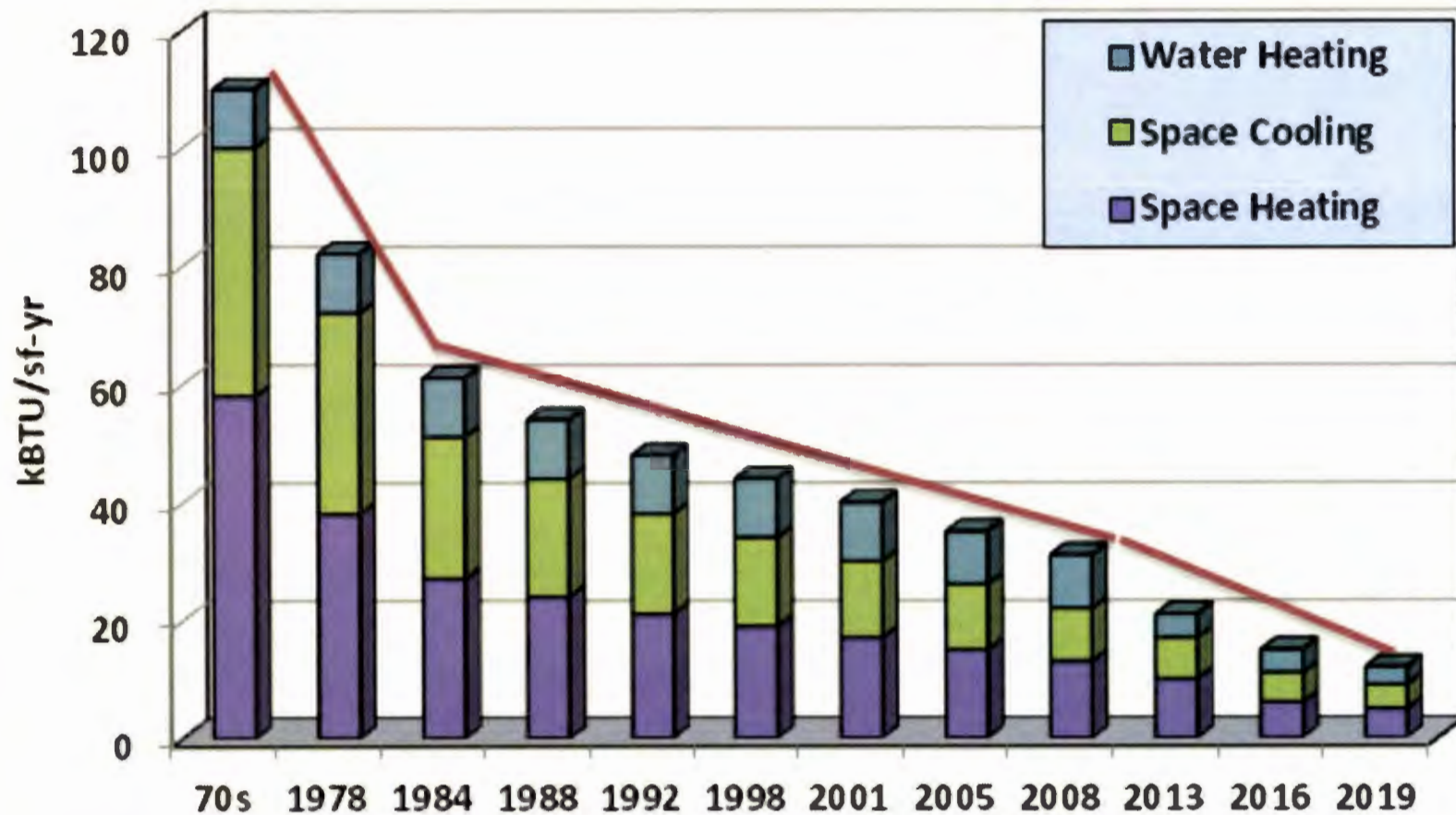
<http://www.bwilcox.com/BEES/BEES.html>



# BEES Impact on EUI



Impacts of Building Standards on Home Energy Use





# 2019 BEES Schedule



2019 STANDARDS UPDATE SCHEDULE	
DATE	MILESTONES
August 2016 to April 2017	Stakeholder-hosted workshops & proposal development
January 2017-March 2017	Second round of Stakeholder-hosted workshops & proposal development
<b>April 2017</b>	<b>DRAFT Code proposals (CASE Reports) submitted to the CEC</b>
June 2017	Pre-rulemaking Draft Express Terms prepared, made available for public comment
<b>June 2017</b>	<b>FINAL Code proposals (CASE Reports) submitted to the CEC</b>
July 2017	Incorporate public comments into Draft Express Terms; prepare Notice of Proposed Action (NOPA) and Initial Statement of Reasons (ISOR)
September 2017	File Draft Express Terms, ISOR, NOPA with CBSC
November 2017	Draft Express Terms, ISOR, NOPA published; 45-day Public Review Period begins
November-December 2017	Host 45-day Language Hearings
January 2018	End of 45-day review/comment period; begin review of submitted comments and preparation of 15-day language
February 2018	Publish 15-day language; begin 15-day Public Review Period
May 2018	Adopt Final Express Terms of the 2019 Standards at Business Meeting
June 2018	Begin updating Software, Compliance Manuals, Electronic Documents
July/August 2018	CBSC Code Advisory Committee Meeting-CalGREEN
September/October 2018	Adoption CalGREEN (energy provisions) at Business Meeting
November 2018	Deliver Final Rulemaking Package to CBSC; Approve updates to Compliance Manuals
December 2018	CBSC Approval Hearing
January 2019	Make Software, Compliance Manuals, Electronic Documents Available to Industry
January 1, 2020	Effective Date of 2019 Building Energy Efficiency Standards (Title 24, Part 6)

# Questions?





# Countdown to 2020



## Question #1

- ❧ If providing a PV system is not the answer, what are the efficiency measures that can bring my project into T-24 compliance?

# Question 1 Answers



## ☞ Efficiency Measures Include:

- ☞ High Performance Attics
- ☞ High Performance Walls
- ☞ High Performance Glazing & Thermal Bucks
- ☞ High Performance Equipment
  - ☞ Heating, Cooling, Whole House Fans, Plumbing

# Countdown to 2020



## Question #2

☞ Okay, so help me understand the different ways to achieve a high performance attic; what are my options?

# Questions #2 Answers



Three general options for high performance attics:

- ❧ A. Insulation above the roof rafters
  - ❧ Vented attic, insulation occurs at ceiling level
  - ❧ Continuous or weighted average
  - ❧ Half SIPS – Structure Insulation
  
- ❧ B. Insulation below the roof deck
  - ❧ Unvented with Spray Foam
  - ❧ Vented or Unvented with Batt or Netted Insulation
  
- ❧ C. Ducts in conditioned space

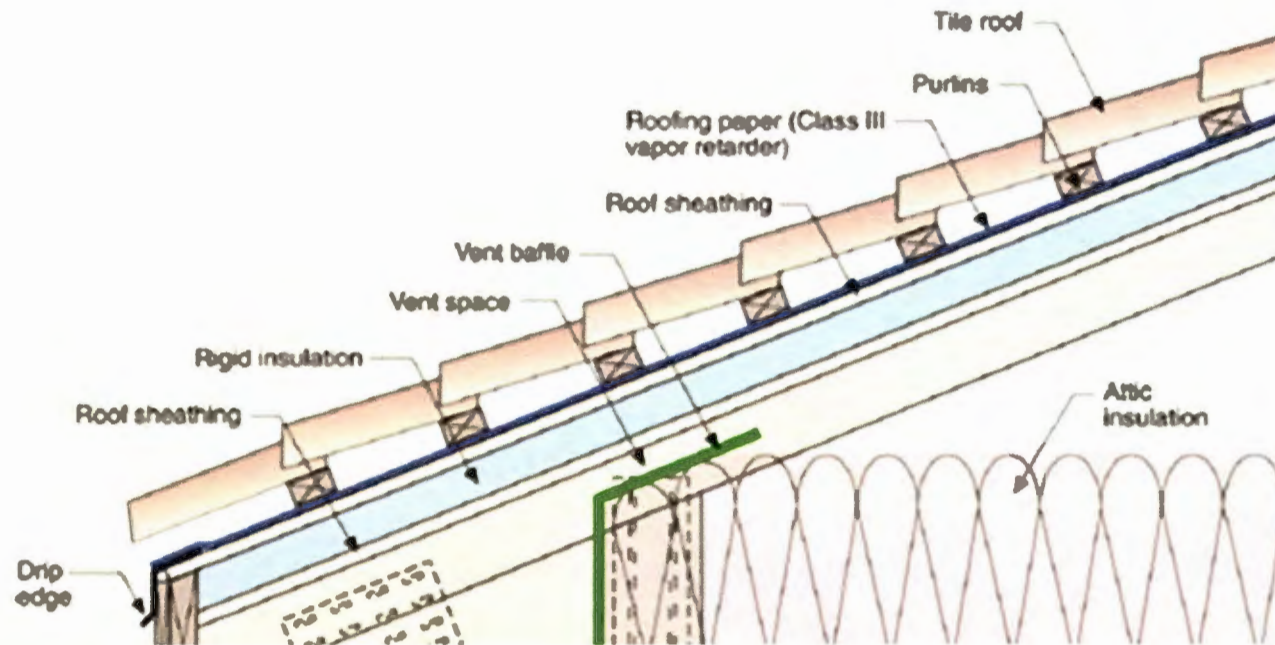




# Insulation Above Roof Deck

# Insulation of Above Roof Deck

HPA - Rigid Foam Board Above the Deck



# Half SIPS - Polyiso Foam Board

## Roof Insulation



### Rmax Nail Base Products



### Meet CA 2016 Title 24 Roof Insulation Requirements

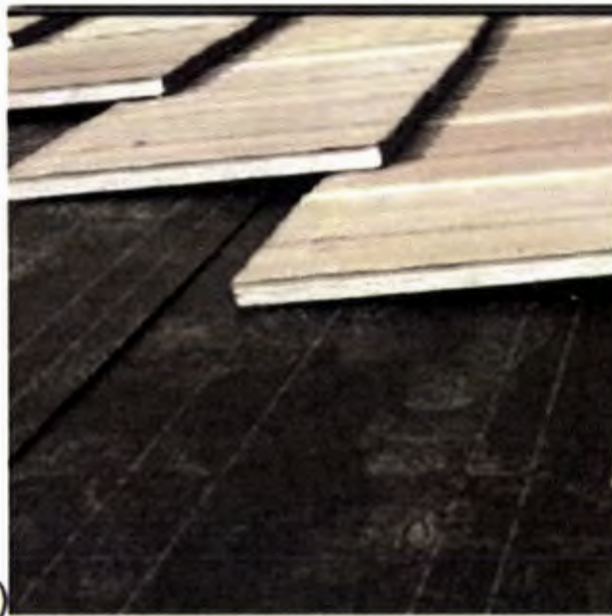
- Option A
- Continuous Insulation Above Roof Rafters
- No Air Space (R8) or With Air Space (R6)



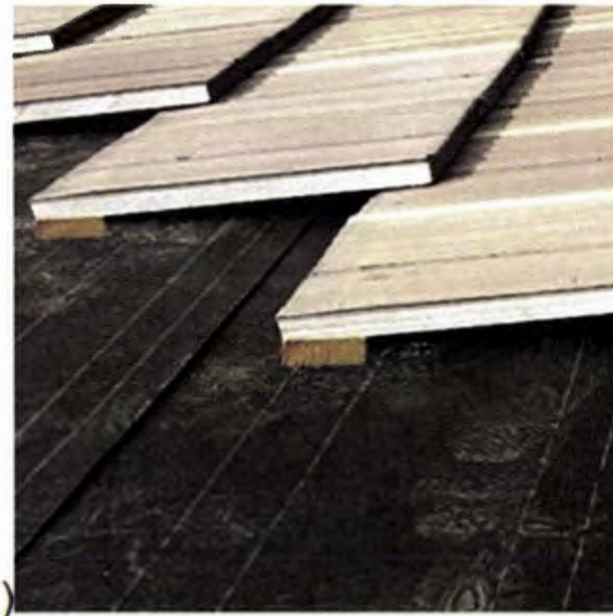
# Insulated Roof Tile Above Roof Deck



- HPA – Insulated Roof Tile (a) attached directly to roof deck (b) attached to batten



(A)

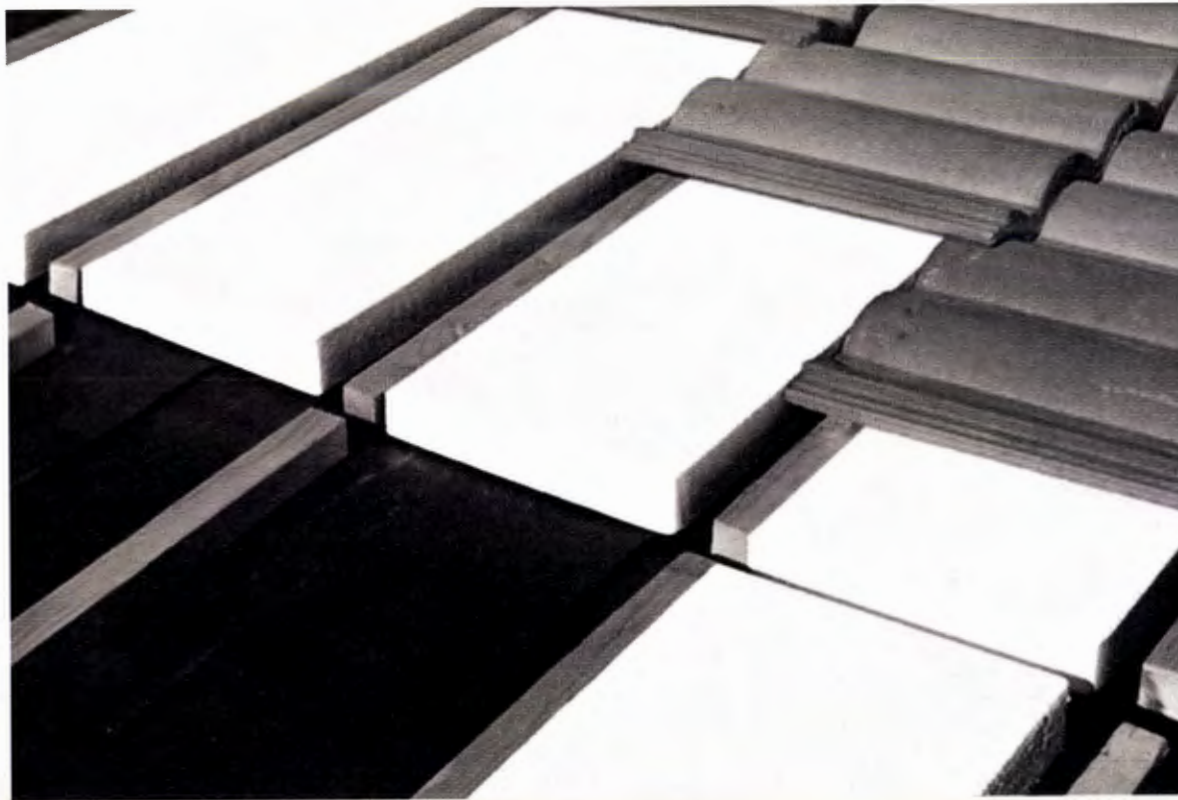


(B)

# Insulated Roof Tile Above Roof Deck



Wedge-it Foam Board Above the Deck





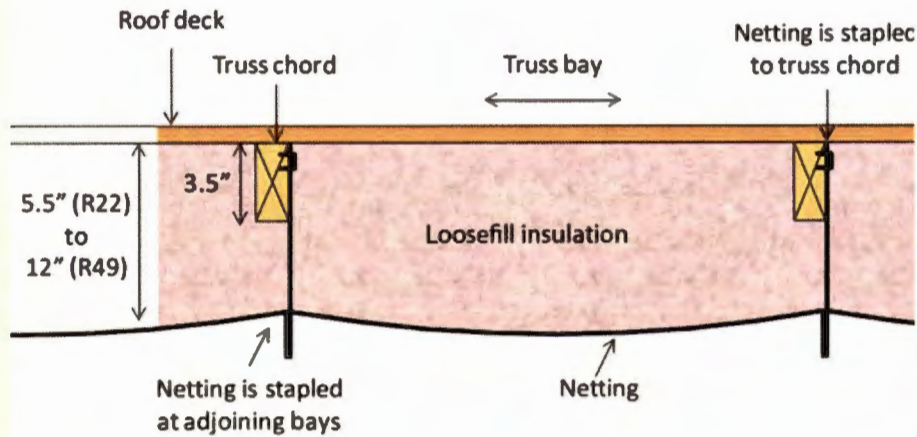
# Insulation Below Roof Deck



# Spray Foam Below Roof Deck



# Netted Fiberglass Below Roof Deck

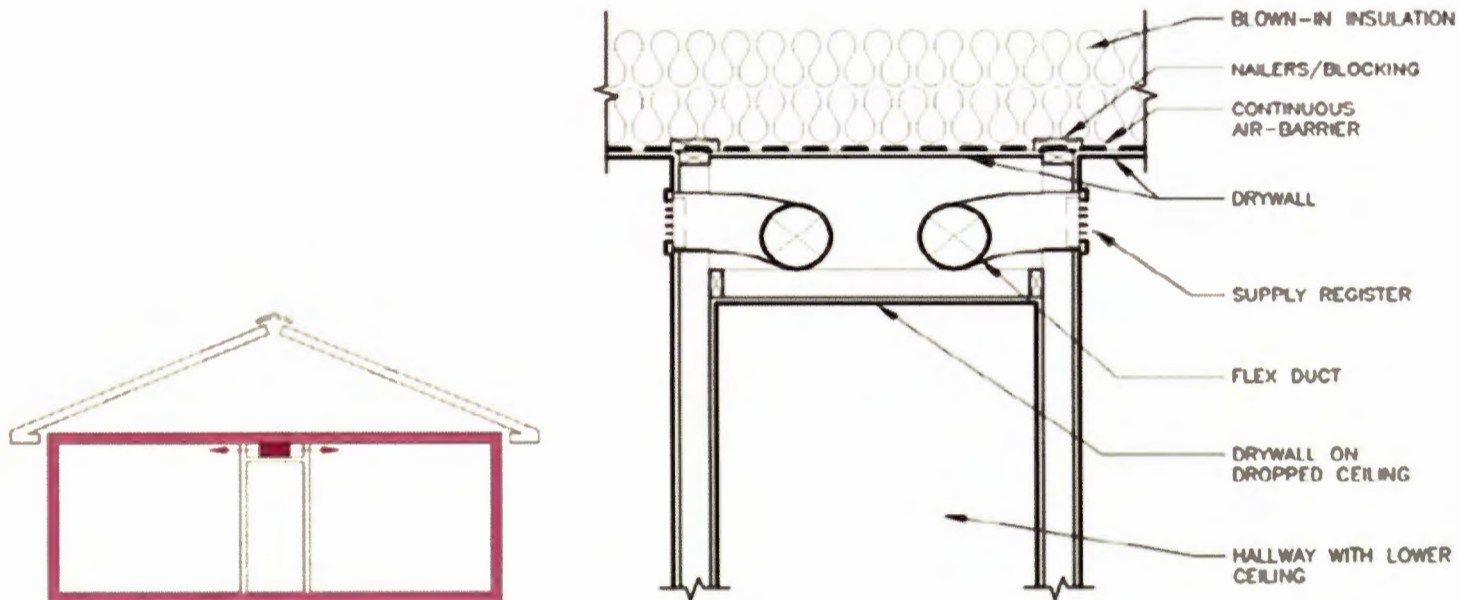




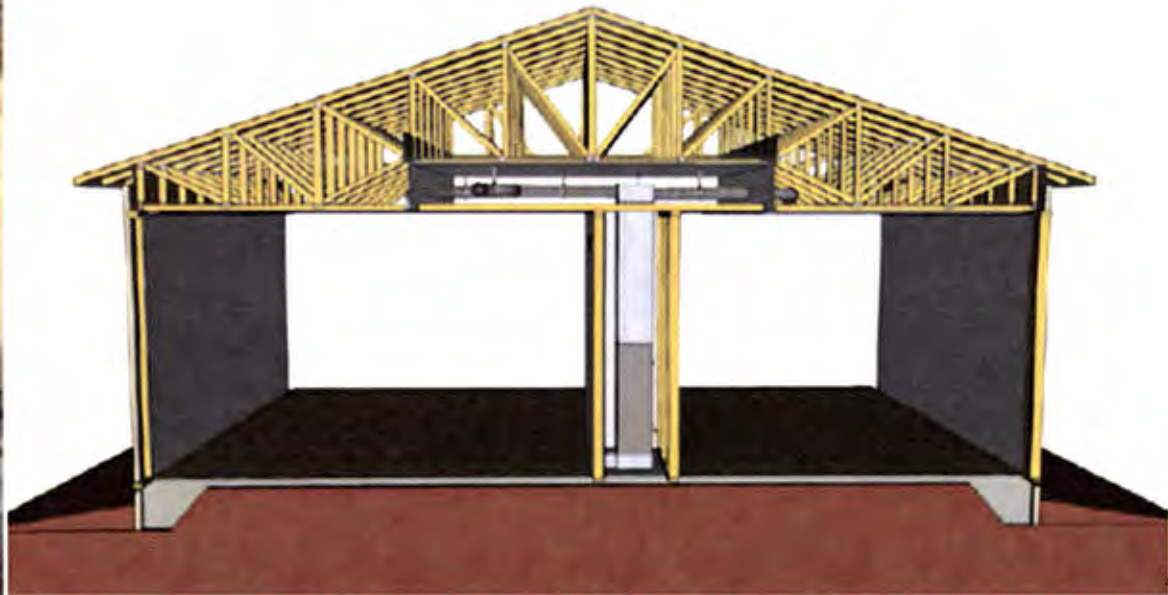
# Ducts in Conditioned Space



# Ducts in Conditioned Space - Dropped Ceiling

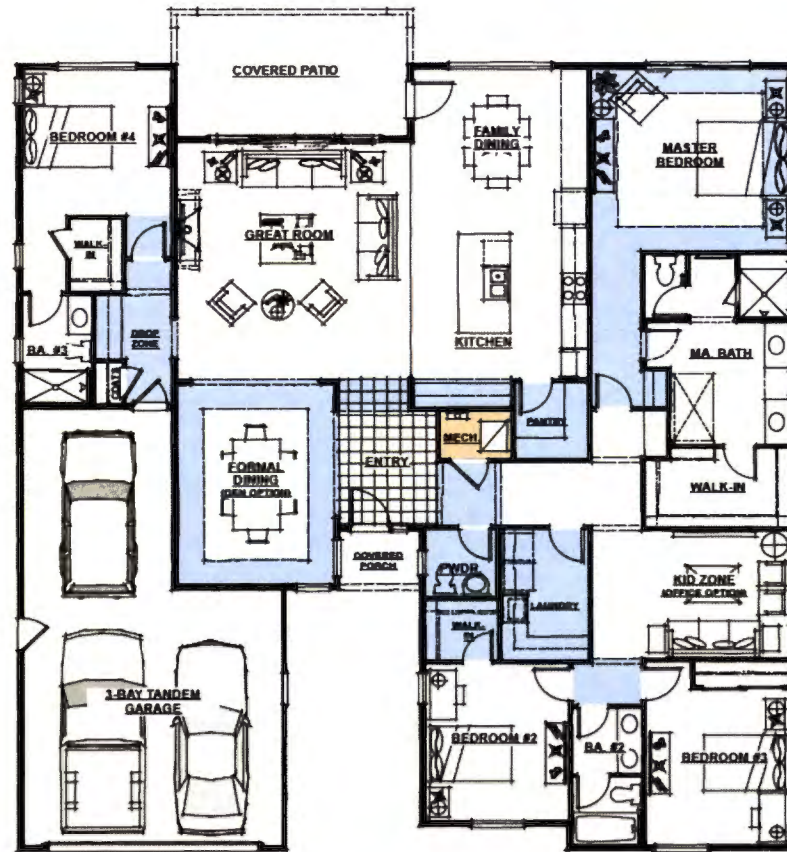


# Ducts in Conditioned Space – Mechanical Closet



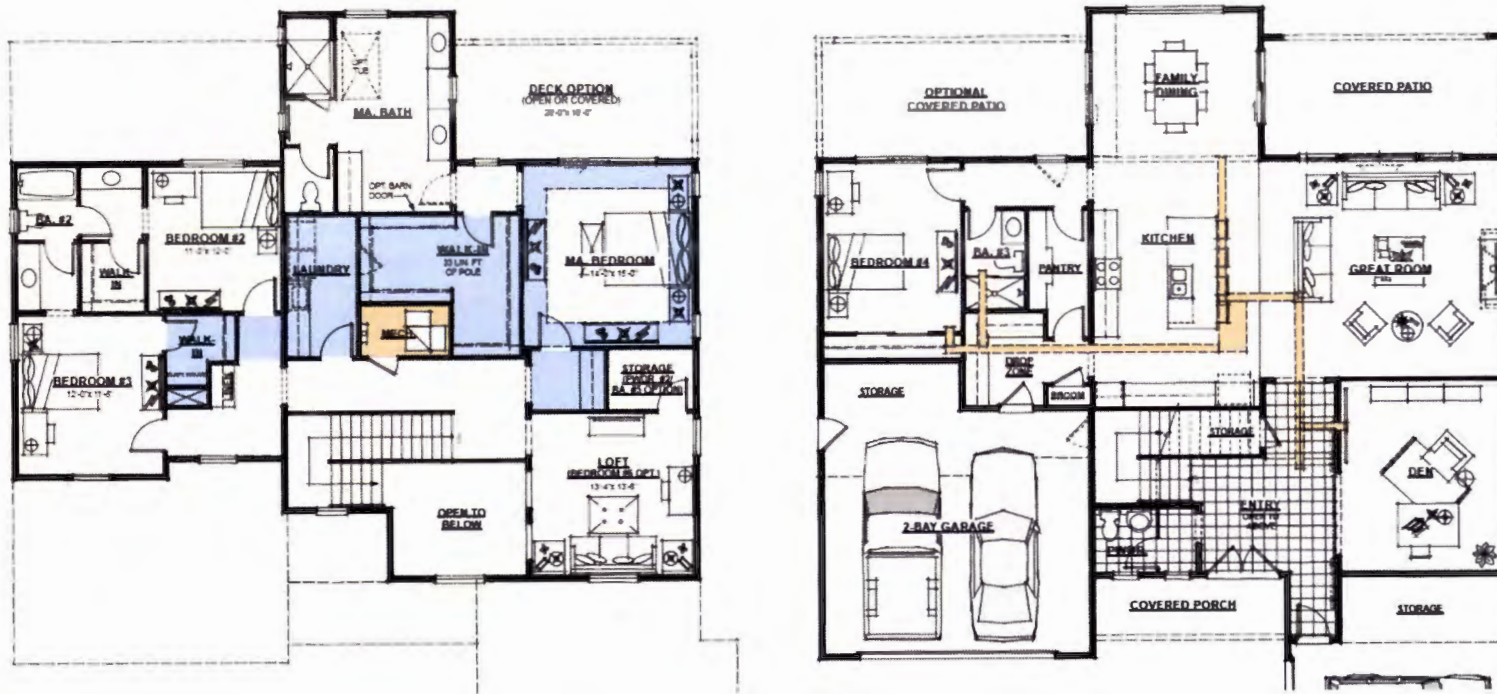
# Ducts in Conditioned Space - 1 Story

---





# Ducts in Conditioned Space – 2 Story



# Ducts in Conditioned Space - Dropped Ceiling

---



# Countdown to 2020



## Question 3

- Now lets talk about high performance walls, I keep hearing about foam board with higher R-Value than the 1" EPS we typically use with 1-coat stucco.



# Question #3 Answers



Examples of high R-value foam board insulation:

- ❧ Polyiso foam board - **Johns Manville, R-Max**
- ❧ XPS (Extruded polystyrene foam board) - **Owens Corning**
- ❧ GEPS (Graphite expanded polystyrene) - **Insulfoam**
- ❧ EPS (Expanded polystyrene foam board with foil backing) - **Insulfoam**

# Polyiso Foam Board









# GEPS - Graphite Expanded Polystyrene

---



# EPS - Expanded Polystyrene



**R-TECH**  
 Manufactured by insulfoam®  
 www.insulfoam.com

Skin Surfaces  
 Front and Back  
Results in excellent moisture resistance for long term durability and energy performance.

Thoroughly Tested  
Thermal Transfer, Moisture Vapor, Dimensional Change, Compressive Strength, and Impact Resistance.

**INSECT RESISTANT RIBB INSULATION**  
Meets or exceeds all applicable code requirements.

**MOLD RESISTANT RIBB INSULATION**  
Meets or exceeds all applicable code requirements.

**R-Values**

at 25° F	at 40° F	at 75° F	per inch thickness	Type I 1 1/2"	Type VII 1 254"	Type II 1 5/8"	Type IX 2 1/4"
4.35	4.17	3.95	4.54	4.25	3.95	4.78	5.00
4.17	4.00	3.78	4.36	4.07	3.78	4.60	4.82

# Countdown to 2020



## Question #4

- ❧ My project has wood siding. Is it possible to achieve a high performance wall with siding?

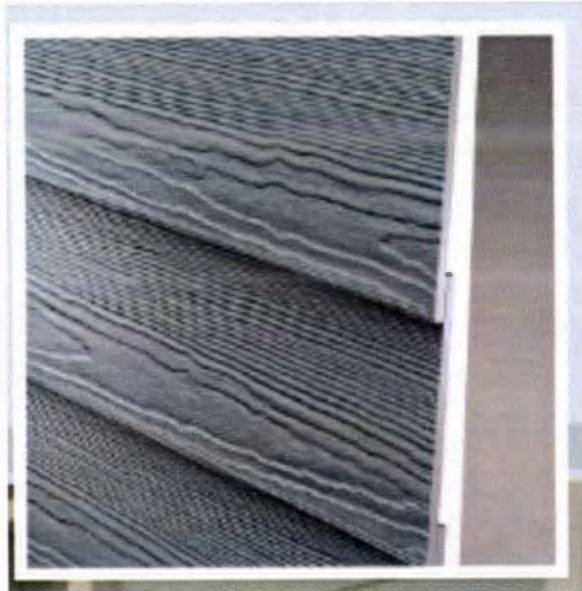


# Question #4 Answers



- ∞ Possibilities for H.P.W.'s with hardboard siding:
- ∞ Installing high R-value rigid foam under the siding
  - ∞ Market demand is expected to increase manufacturers product creation, i.e. Hardi with integrated foam
  - ∞ Insulated Rough Opening Extension (Thermal Buck)

# High R-Value Rigid Foam

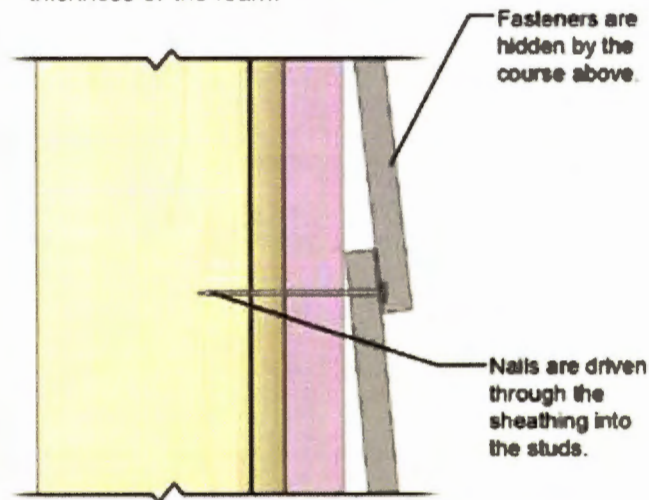


# Continuous Insulation Under Siding

---

## FASTENER SELECTION:

When attaching lap siding products over foam, the length of the chosen fastener must be extended in length by the thickness of the foam.



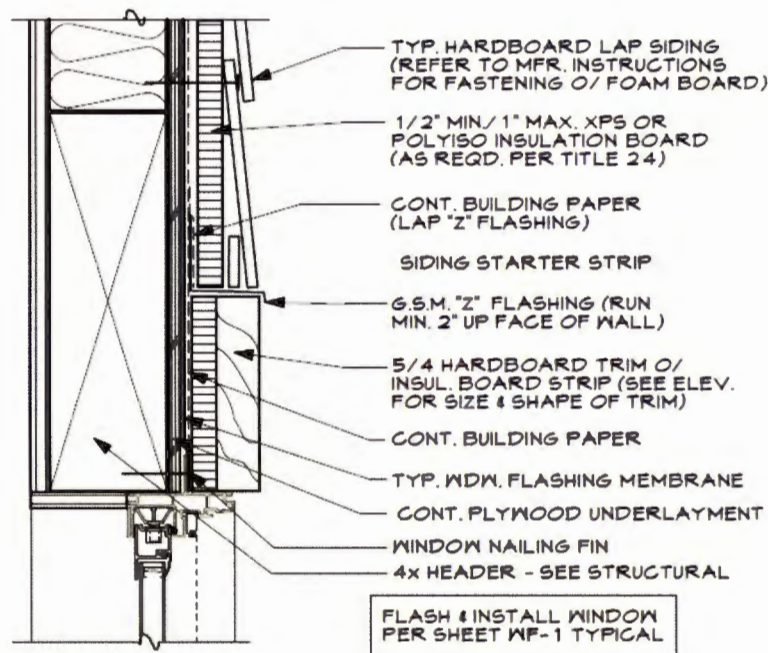
*When attaching lap siding products over foam the length of the chosen fastener must be extended by the thickness of the foam to achieve the same required holding power.*



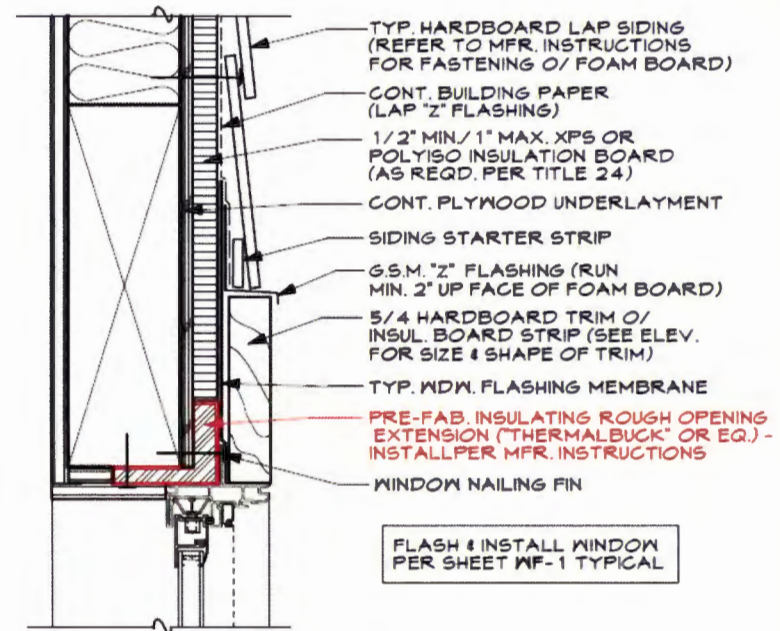
# Thermal Buck



# Installation Methods



**WINDOW HEAD**  
 (HARDBOARD SIDING O/ FOAM)



**WINDOW HEAD**  
 (HARDBOARD SIDING O/ FOAM  
 w/ INSULATING R.O. EXTENSION)

# Countdown to 2020



## Question #5

- Will it be possible to use enough other efficiency measures to avoid both high performance walls and attics?



# Question #5 Answers



- ❧ It is very unlikely – especially in hot climates – that 2019 compliance will be achieved without implementing both high performance walls and attics
- ❧ High performance glazing with high performance equipment could achieve compliance
  - ❧ Cost may be excessive but incentives may be possible

# Countdown to 2020



## Question #6

- ❧ Besides high performance walls and attics, what other measures can help achieve T-24 compliance?

# Question #6 Answers



- ❧ Additional features that help to achieve compliance:
  - ❧ Central Integrated Fan Systems; Cool Vents
  - ❧ High Efficiency HVAC Equipment, Tankless Water Heaters and Appliances
  - ❧ High Performance Glazing
  
- ❧ Note that Quality Insulation Installation (QII) will likely become a requirement in 2019, **it will no longer be a credit option**



# Summary



## ☞ High Performance Attics

- ☞ Sheathed Panels - **R-max, Insulroof**
- ☞ Foam panel roof tile underlayment - **Wedge-It**
- ☞ Insulated roof tile - **Ensoltis Green Hybrid Roofing**
- ☞ Below deck insulation w/ netting - **Owens Corning, Certainteed**
- ☞ Below deck spray foam insulation - **Five Star Insulation, Truteam**

## ☞ High Performance Walls

- ☞ Polyiso foam board - **R-Max**
- ☞ XPS (Extruded polystyrene foam board) - **Owens Corning**
- ☞ GPS (Graphite impregnated polystyrene) - **Insulfoam**
- ☞ EPS (Expanded polystyrene foam board) - **Atlas**
- ☞ High performance window buck - **ThermalBuck**

## ☞ High Performance Fenestration

- ☞ HP3MAX Pro Series R-5 - **Legacy Window & Plygem**

## ☞ High Performance HVAC Systems

- ☞ Aquachill - **Villara**

## ☞ Cooling Ventilation

- ☞ SmartVent - **Villara**
- ☞ Whole house fans - **AirScape**

# Thank you to our Sponsors



**Notepad Sponsor - Duct Testers, Inc.**

**Breakfast Sponsor - Brazos Urethane, Inc.**

**Breakfast Sponsor - Valley Duct Testing**

**Coffee Sponsor - Rmax, Inc.**

## Vendor Table Sponsors

5 Star Performance Insulation

AirScape Inc.

Atlas EPS

Brazos Urethane, Inc.

CalCERTS, Inc.

California Living & Energy

CertainTeed

Citadel Roofing and Solar

DuctTesters, Inc.

E3 California

Legacy Windows, Inc.

Owens Corning

Ply Gem Windows

SolarCity

ThermalBuck / BRINC Building  
Products

Timberworks Construction

TruTeam

Villara Building Systems

WEDGE-IT CO.

# Information Resource



❧ WISE - <http://www.wisewarehouse.org/>

❧ CA Public Utility Commission - Energy Code Ace - <http://energycodeace.com/>



# Countdown to 2020



## Questions???