

# DOE Zero Energy Ready Home Second Production Builder Round Table

January 2015

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# **DOE Zero Energy Ready Home**

## **Second Production Builder Round Table**

**October 23 - 24, 2014**

**Suwanee, Georgia**

**Prepared for**

**The U.S. Department of Energy's Building America Program**

**Office of Energy Efficiency and Renewable Energy**

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**January 2015**

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# 1 Round Table Attendees

## 1.1 Participants

- Steve Bostic, Amerisips
- David Brewer, Southern Homes
- Steve Brown, Carl Franklin Homes
- Mike DiGiovanni, Boulder Creek Neighborhoods
- Randy Erwin, M Street Homes
- Stephan Kamrass, Sareth Builders
- John McLinden, StreetScape Development
- Gene Myers, New Town Builders
- Greg Pacholski, StreetScape Development
- Bill Rectanus, New Town Builders
- Todd Usher, Addison Homes
- Thomas Wade, Palo Duro Homes
- Brandon Weiss, Evolutionary Home Builders
- Todd Lewis, Tommy Williams Homes

## 1.2 Staff

- Sam Rashkin, U.S. Department of Energy
- Jamie Lyons, Newport Partners
- Joe Nebbia, Newport Partners
- Lindsay Parker, Energetics Incorporated

## 1.3 Sponsors

- Mike Vasquez, Mitsubishi
- Eric Griffin, Mitsubishi
- Rick Noritz, Mitsubishi
- Paul Doppel, Mitsubishi

## 2 Round Table Overview

### 2.1 Purpose

A small contingent of our nation’s innovative production builders is leading a movement towards widespread adoption of U.S. Department of Energy (DOE) Zero Energy Ready Homes (ZERHs). Overall, the housing industry is slow to embrace major innovations—a barrier to achieving this historic level of performance. However, this select group of builders has found business and technical solutions that enable them to effectively deliver high-performance homes—homes so energy efficient that a renewable energy system can offset most or all annual energy consumption. In some cases, solar electric systems are provided as standard equipment. Thanks to the DOE Zero Energy Ready Home program, American homebuyers now have easy access to homes that live better, work better, and last better including never having to worry about significant utility expenses.

The second historic gathering of the top executives from leading builders provided a forum for these builders to share business and technical lessons learned, identify a list of common challenges faced delivering DOE ZERHs, and identify new solutions to bring back to their individual businesses. Over this day-and-a-half-long meeting, there was a remarkable, sustained level of energy and collaboration with active discussion. This report documents the key results. DOE looks forward to many new builders joining this prestigious group next year.

### 2.2 Desired Outcomes

- Shared business and technical lessons learned among leading ZERH production builders
  - Business decision making processes leading to ZERH production
  - Business solutions that effectively deliver ZERHs
  - Business metrics associated with selling ZERHs
  - Technical solutions that meet performance, cost, and risk objectives
- List of key trends confronting home builders
- List of key obstacles confronting ZERH adoption
- List of successful strategies delivering ZERH adoption
- List of actions DOE can do to support ZERH builders
- List of specific business actions for each builder



### 3 Round Table Agenda

Table 1

**Day One Agenda: Zero Energy Ready Home Industry Leader Overview**

Time	What	Who/How
7:45 a.m. – 8 a.m.	Bus from Hotel to Meeting	
8 a.m. – 8:15 a.m.	Networking	
8:15 a.m. – 8:40 a.m.	Meeting Review/Agenda /Introductions Why do you build ZERH homes?	Sam Rashkin Around the Room
8:40 a.m. – 8:50 a.m.	Mitsubishi Electric Welcome	
8:50 a.m. – 9:20a.m.	What DOE Learned About ZERH Last Year	Sam Rashkin
9:20 a.m. – 4:30 p.m.	<b>Leading ZERH Production Builder Presentations:</b> <ul style="list-style-type: none"> <li>• Business Overview and Why ZERH</li> <li>• Key ZERH Lessons Learned               <ul style="list-style-type: none"> <li>– Architectural Solutions</li> <li>– Technical Solutions</li> <li>– Cost Solutions</li> <li>– Sales Solutions</li> </ul> </li> <li>• Challenges Looking Forward</li> </ul>	20 – 25 minute presentations; 10 – 15 minutes questions/discussion
9:20 a.m. – 9:55 a.m.	Palo Duro Homes (NM)	Tom Wade
9:55 a.m. – 10:30 a.m.	M Street Homes (TX)	Randy Erwin
10:30 a.m. – 10:40 a.m.	Break	
10:40 a.m. – 11:15 a.m.	StreetScape Development (IL)	John McLinden
11:15 a.m. – 11:50 a.m.	New Town Homes (CO)	Gene Meyers
11:50 a.m. – 12:25 p.m.	Tommy Williams (FL)	Todd Louis
12:25 p.m. – 1:25 p.m.	Lunch	
1:25 p.m. – 2 p.m.	Boulder Creek Neighborhoods (CO)	Mike DiGiovanni
2 p.m. – 2:35 p.m.	Southern Homes (AL)	David Brewer

2:35 p.m. – 3:10 p.m.	Amerisips (SC)	Steve Bostic
3:10 p.m. – 3:20 p.m.	<b>Break</b>	
3:20 p.m. – 3:55 p.m.	Carl Franklin Homes (TX)	Steve Brown
3:55 p.m. – 4:30 p.m.	Sareth Builders (OH)	Steve Kamrass
4:30 p.m. – 4:45 p.m.	Wrap-Up – Summarize Day	Sam Rashkin

### Day Two Agenda: Zero Energy Ready Homes Moving Forward

7:45 a.m. – 8 a.m.	<b>Bus from Hotel to Meeting</b>	
8 a.m. – 8:15 a.m.	<b>Networking</b>	
8:15 a.m. – 8:50 a.m.	Mandalay Homes (AZ)	Dave Everson
8:50 a.m. – 9:25 a.m.	Evolutionary Homes (IL)	Brandon Weiss
9:25 a.m. – 10 a.m.	Addison Homes (GA)	Todd Usher
10 a.m. – 10:20 a.m.	<b>Break</b>	
10:20 a.m. – 11 a.m.	What Learned From Other Builder Presentations	Brainstorm
11 a.m. – 11:30 a.m.	What Specific Actions For Improving Your Business	List/Discuss
11:30 a.m. – 12 p.m.	What Can DOE do Better Supporting ZERH Builders	Brainstorm
12 p.m. – 12:15 p.m.	Wrap-Up/Meeting Review/Future Meetings?	+/-
12:15 p.m. – 1:15 p.m.	<b>Lunch/Adjourn</b>	

## 4 Why Choose to Build Zero Energy Ready Homes

At the beginning of the meeting, each builder identified specific reasons why they choose to build and market high-performance, zero energy or Passive homes. The table below summarizes these key reasons.

**Table 2**

Type	Reasons
<b>Business Costs</b>	<ul style="list-style-type: none"><li>• Best way to build most cost effectively for homebuyers</li><li>• Offer low ownership cost workforce housing solution</li><li>• These homes are becoming more affordable, especially for experienced innovators</li></ul>
<b>Leadership</b>	<ul style="list-style-type: none"><li>• Differentiation</li><li>• Stronger competition against “low-price” builders</li><li>• Increasing consumers identification and requests for ‘Zero’/DOE ZERH</li><li>• Offer customers the “best”</li><li>• Strong 3rd party DOE brand</li><li>• Join and lead a growing, zero-energy movement</li></ul>
<b>Sustainability</b>	<ul style="list-style-type: none"><li>• Right thing to do</li><li>• More energy efficiency</li><li>• Personal convictions and interests in sustainability</li></ul>

## 5 Builder-Identified Zero Energy Ready Home Challenges

The attending builders were asked to identify the most difficult challenges they have confronted and/or continue to address with the move to ZERHs. These challenges are listed in the table below. Please note: Many of these challenges are not experienced by every builder, instead, they are largely individual cases.

**Table 3**

Category	Challenge
Education	<ul style="list-style-type: none"> <li>• Lack of guidance for ZERH homeowners on the best ways to use the ZERH features</li> <li>• Consumer perception of excessive cost for ZERHs</li> <li>• Lack of code officials familiarity with new techniques and products used in ZERHs</li> </ul>
Technical	<ul style="list-style-type: none"> <li>• Lack of clear solutions for identifying and implementing an optimized comfort system</li> <li>• Lack of “low-hanging fruit” leaves the industry having to work harder for additional energy savings</li> <li>• Difficulty implementing efficient hot water distribution</li> <li>• Air sealing the marriage wall in townhouses without violating fire rated assembly requirements</li> <li>• Wireless internet connectivity can be more difficult in super-insulated homes</li> </ul>
Labor	<ul style="list-style-type: none"> <li>• Limited access to skilled trade partners for quality installations</li> <li>• Difficult to find skilled sales professionals</li> </ul>
Rating	<ul style="list-style-type: none"> <li>• Issues with inconsistent quality control for HERS ratings</li> <li>• Problems with HERS software accuracy below HERS 45</li> <li>• Lack of clear definition for “Zero Energy”—is HERS 0 necessary to be a Zero Energy Home?</li> </ul>
Other	<ul style="list-style-type: none"> <li>• Appraisal/lending process is still an obstacle to proper valuation of ZERHs</li> <li>• Uncertainty in utility policies and fees regarding solar electric systems</li> <li>• Difficulty calculating business metrics</li> </ul>

## 6 Successful Solutions Used by Zero Energy Ready Home Builders

The following table summarizes key solutions builders implemented to align with ZERH program requirements.

**Table 4**

Category	Solutions	
Design	<ul style="list-style-type: none"> <li>• Use Building Information Modeling (BIM) for creative, hand-drawn renderings</li> <li>• Use energy efficiency features to create design elements</li> <li>• Integrate universal design for long-term “aging in place”</li> <li>• Employ an integrated design team including builder, trade partners, HERS rater, architect/designer, purchasing manager, and sales team</li> </ul>	
Cost	<ul style="list-style-type: none"> <li>• Comprehensively examine and understand cost trade-offs</li> </ul>	
Sales	Customer Testimonials	<ul style="list-style-type: none"> <li>• Organize ‘Meet Your Neighbor’ events</li> <li>• Invite buyers to after-sale seminars to educate your new sales force</li> <li>• Proactively secure utility bill information from buyers and share results with customers</li> <li>• Capture exceptional experiences in messaging</li> </ul>
	Messaging	<ul style="list-style-type: none"> <li>• DOE ZERH is a ‘trusted brand’ solution for builders</li> <li>• Link energy efficiency to quality</li> <li>• Focus on monthly/annual cost, instead of payback</li> <li>• Leverage third party validation for increased credibility</li> <li>• Provide an educational newsletter to continue customer relationship and ensure better home maintenance/operations</li> </ul>
	Approaches	<ul style="list-style-type: none"> <li>• Sell homes as consumer products</li> <li>• Don’t make energy efficiency an option</li> <li>• Offer customer satisfaction guarantees</li> <li>• Create homeowner manual or guide that explains how to maintain a high-performance home and give to each buyer</li> </ul>

<b>Technical</b>	Envelope	<ul style="list-style-type: none"> <li>• There are numerous options for high-R assemblies, including:             <ul style="list-style-type: none"> <li>– Advanced Framing w/ Rigid Foam</li> <li>– Structural Insulated Panels (SIPS)</li> <li>– Double Wall</li> <li>– Insulated Concrete Forms (ICFs)</li> <li>– Liquid applied air/water barriers</li> <li>– Superior Walls</li> </ul> </li> </ul>
	Hot Water	<ul style="list-style-type: none"> <li>• There are several efficient hot water distribution system options, including:             <ul style="list-style-type: none"> <li>– On-demand hot water recirculation system (push button or motion sensor)</li> <li>– Smart timer recirculation with tankless water heaters</li> </ul> </li> <li>• Heat pump water heaters are a good option in all electric homes</li> </ul>
	Comfort Systems	<ul style="list-style-type: none"> <li>• There are numerous options for optimized comfort systems including:             <ul style="list-style-type: none"> <li>– Mini-split systems</li> <li>– High velocity ducted HVAC</li> <li>– HVAC with desiccant dehumidification powered by micro Combined Heat and Power (CHP)</li> <li>– Conditioning Energy Recovery Ventilator (CERV)</li> <li>– Conventional HVAC (some with humidity-based variable speed operation)</li> </ul> </li> <li>• Duct location in conditioned space</li> </ul>
	Software / Lighting	<ul style="list-style-type: none"> <li>• Building Information Modeling (BIM)             <ul style="list-style-type: none"> <li>– Procurement</li> <li>– Mechanicals (layout and avoidance of space conflicts)</li> <li>– Show Quality Construction Details</li> </ul> </li> <li>• Daylighting</li> </ul>

## 7 What DOE Can Do to Support Zero Energy Ready Home Builders

The attendees provided feedback on how DOE could best use its resources to support their commitments to ZERH. The actions included below are impressive because they are all actionable and within the resource availabilities of the program.

**Table 5**

Category	DOE Actions
<b>Technologies and Standards</b>	<ul style="list-style-type: none"> <li>• Establish a means to share or disseminate information on energy efficient products and technologies</li> <li>• Create or share industry guidance on acceptable temperature and relative humidity range for consumers</li> </ul>
<b>Mortgage Leadership</b>	<ul style="list-style-type: none"> <li>• Work with banks to establish preferred terms in mortgages for ZERHs aligned with lower risk</li> <li>• Enhance DOE cooperation with HUD and White House on appraisal and lending processes</li> <li>• Facilitate use of Green Appraisal Addendum Form with sales contract</li> </ul>
<b>Education and Outreach</b>	<ul style="list-style-type: none"> <li>• Increase communication on sales training and other training opportunities</li> <li>• Create a Housing Industry blog or community online forum for ZERH builders</li> <li>• Develop education for Residential Plan Designers               <ul style="list-style-type: none"> <li>– Create Building Science certification for architects/designers</li> <li>– Leverage Passive House Consultant training</li> </ul> </li> </ul>
<b>Branding and Messaging</b>	<ul style="list-style-type: none"> <li>• Write a press release on the round table, listing attendees</li> <li>• Create messaging content for builders, including more performance metrics</li> <li>• Increase DOE messaging and awareness to consumers</li> <li>• Create education materials for consumers on how to live in ZER Homes</li> </ul>
<b>Improvements for the next Round Table</b>	<ul style="list-style-type: none"> <li>• Dedicate the next meeting to solve predetermined issues from polling group of builders</li> <li>• Plan more time for discussion and less on presentations</li> </ul>

## 8 Next Steps

All attendees agreed that the discussion was extremely useful. Several follow-up actions were identified and are shown in Table 6 below.

**Table 6**

	Follow-up Actions
<b>DOE Next Steps</b>	<ul style="list-style-type: none"> <li>• Enhance program messaging</li> <li>• Support consumer education for effectively operating a DOE ZERH</li> <li>• Lead mortgage/appraisal outreach for preferred term loans and increase value recognition in appraisals</li> <li>• Establish Zero Energy Ready Home Community Online Community</li> </ul>
<b>Builder Next Steps</b>	<ul style="list-style-type: none"> <li>• Implement round table lessons learned relevant to each business</li> <li>• Build and certify homes and send in Certification Reports to DOE</li> <li>• Promote DOE Zero Energy Ready Home to buyers</li> <li>• Consider Partnering with a Building America team to do research (e.g., feasible DOE Zero Energy Ready Home business metrics)</li> <li>• Continue to engage DOE Zero Energy Ready Home staff with technical or program questions</li> </ul>
<b>General Next Steps</b>	<ul style="list-style-type: none"> <li>• Continue communication between DOE and builders</li> <li>• Consider timing, location, topics for next meeting</li> </ul>



# Appendix A: DOE Actions in Response to First Production Builder Round Table Feedback

Table 7

Feedback Category	Builder Feedback Requesting DOE Actions	DOE Progress
<b>Independent Verification</b>	Develop certification that will be trusted more than builder marketing efforts	DOE will continue leveraging a consistent message from sponsors and HERS raters that DOE and the label represent a trusted voice of authority.
	Conduct independent cost and performance estimates on DOE Challenge Homes	DOE has developed Zero Energy Ready Home Cost and Savings performance estimates and posted them on the ZERH website. DOE will continue developing aggregated savings impacts and conversions to other health and economic impacts.
	Promote the DOE Challenge Home label to provide comparisons that builders could not make on their own	Based on savings estimates noted above, DOE will develop comparisons of ZERH performance to ENERGY STAR Certified Homes v3 and existing homes that builders can reference.
	Work with modeling industry to more accurately capture innovation performance	DOE will continue to work through Building America to improve the accuracy of modeling tools.
<b>Mortgage Leadership</b>	Promote banks providing preferential products for DOE Challenge Homes	DOE is coordinating with the Environmental Protection Agency (EPA) on a joint financing partnership with lenders who agree to promote the Green Appraisal process including selection of appraisers from the Certified Green Appraiser list and ensure hand-off of HERS rater completed Green Appraisal Form to the appraiser.
	Promote the use of Green Addendum for appraisals	
	Conduct outreach to real estate professionals to gain buy-in	DOE will seek a presence at real estate industry events and start a sales training program in the summer of 2014 (see below).
	Support the SAVE Act	DOE cannot lobby on behalf of any legislation but will continue to offer any technical assistance as needed.
<b>Education and Outreach</b>	Deliver sales training	The sales training curriculum is complete, and program delivery will start the summer of 2014.
	Develop a real estate professional training module	A 45-minute presentation will be developed for real estate conferences; staff will look for the best venues.
	Publish case studies and testimonials – a virtual Parade of Homes	Templates are being developed, and website design is in progress. The key to launch is getting critical mass of ZERHs certified and profiled.
	Conduct media outreach	Media outreach is a continuous effort for DOE. Staff will provide a list of all media placements on the ZERH website.

<b>Branding and Messaging</b>	Make U.S. Department of Energy more prominent in name/logo	Per guidance from builders, DOE staff immediately secured a name change from DOE Challenge Home to the DOE Zero Energy Ready Home with a revised logo. Once the brand consultant has provided the final graphics, there was a formal announcement and a post on the website.
	Include “Zero Energy” or “Zero Energy Ready” as part of the program name	See note above.
	Solidify the Zero Energy Ready definition	DOE will continue participating in the Net-Zero Energy coalition to secure a definition with all stakeholders.
	Expand DOE Challenge Homes to gut retrofit projects	This is already possible now that the EPA has made accommodations for ENERGY STAR Certified Homes, v3. That said, gut rehabs will always be a heavier lift.
<b>Building America</b>	Help create opportunities to work on research projects with the world-class experts from Building America	DOE staff has informed Building America management that teams should consider top ZERH builders for potential projects. Builders should notify Sam Rashkin if they are not interested so he can remove them from the list before it is submitted.

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