

# DOE Zero Energy Ready Home

## Third Leading Builder Roundtable Summary

October 2015



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**DOE Zero Energy Ready Home**  
**Third Leading Builder Roundtable Summary**

October 5, 2015  
Denver, Colorado

Prepared for  
DOE Zero Energy Ready Home Program

Prepared by  
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Joe Nebbia and Sam Bowles, Newport Partners, LLC

November 2015



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# 1 Roundtable Meeting Information

## 1.1 Participants

- Anthony Aebi, Greenhill Contracting, Inc
- Anthony Maschmedt, Dwell Development
- Bill Rectanus, New Town Builders
- Chris Trolle, BPC Green Builders
- CR Herro, Meritage Homes
- Greg Mantell-Hecathorn, Mantell-Hecathorn Builders
- Hunter Mantell-Hecathorn, Mantell-Hecathorn Builders
- Ted Clifton, CVH, Inc
- Todd Usher, Addison Homes
- Tim Lowndes, Charles Thomas Homes
- Ray Pruban, Amaris Homes
- Robert Dykins, Glastonbury Housesmith
- Sam Hagerman, Hammer and Hand
- Scott Sanders, BrightLeaf Homes
- Tadashi Shiga, Evergreen Certified

## 1.2 Zero Energy Ready Home Staff

- Sam Rashkin, U.S. Department of Energy
- Jamie Lyons, Newport Partners
- Joe Nebbia, Newport Partners
- Sam Bowles, Newport Partners

## 1.3 Purpose

The nation is on the cusp of a dramatic movement to zero energy ready homes. This includes statewide codes, large developments, and a growing amount of commitment to the DOE Zero Energy Ready Home program. Much of this progress can be attributed to a small contingent of our nation's leading builders who are demonstrating the technical, cost, and design feasibility for this level of excellence. At this meeting, the winners of the DOE Housing Innovation Awards as well as other leading innovative builders, gathered and shared lessons-learned and key challenges moving forward.

The third historic gathering of the top executives from leading builders provided a forum for these builders to work together to identify common needs, successful strategies, and other ideas. Over this half-day meeting, interest was high in achieving solutions and in working together with DOE toward a common goal. This report documents the key results. DOE looks forward to working with this group in the coming year, and adding more builders to this list of innovators.

## 1.4 Desired Outcomes

- List of key lessons-learned by leaders constructing Zero Energy Ready Homes
- List of key challenge moving forward constructing Zero Energy Ready Homes
- List of what DOE can do better to support Zero Energy Ready Home builders

## 2 Roundtable Agenda

October 5, 2015

Time	What	Who/How
1:00 – 1:30 pm	Meeting Review/Agenda /Introductions Best homebuyer experience testimonial	Sam Rashkin Around the Room
1:30 – 2:15 pm	Key Lessons Learned Constructing ZERH	Cards/Sorting
2:15 – 2:30 pm	Sort/Prioritize Key Lessons Learned	Group Ranking
2:30 – 2:45 pm	<b>Break</b>	
2:45 – 3:30 pm	Key Challenges Moving Forward with ZERH	Cards/Sorting
3:30 – 3:45 pm	Sort/Prioritize Key Challenges Moving Forward	Group Ranking
3:45 – 4:15 pm	What Can DOE do Better Supporting ZERH Builders	Brainstorm
4:15 – 4:30 pm	Wrap-Up/Summary	Sam Rashkin, +/-



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### 3 Best Testimonials

The meeting began with a discussion of the value of DOE Zero Energy Ready Homes. Each builder was asked to identify the best testimonials for their product.

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#### Health:

- “[It was the] first time the buyer’s brother was in a house in over 20 years and didn’t need to use his oxygen (he suffers from chemical accident at work and his lungs burned out).” – Builder Quote
- “Air Quality – threw away inhalers.” – Builder Quote

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#### Energy Savings:

- “[The homeowner] couldn’t believe zero energy is possible until he lived 5 years with no bills.” – Builder Quote
- “Buyers tweet their first electric bill... ‘Seattle owes me \$40.’” – Builder Quote
- “Our customer had two weeks to review our website and others before selecting a contractor. After reading about our zero energy homes, their decision was final, before our interview.” – Builder Quote
- “Through energy and utility savings, clients were able to retire two years early.” – Builder Quote
- “We were not planning on moving until we found out we could get a zero energy home.” – Homebuyer Quote
- “[They are] embarrassed to talk with neighbors because they don’t want them to feel bad [about having so much lower utility bills].” – Builder Quote

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#### Better Construction:

- “[I] love my homes, looked at a lot of builders, but realize it’s the things we do different behind the walls that matter most.” – Builder Quote
- ABC7 Realtor Video – Builder News Item

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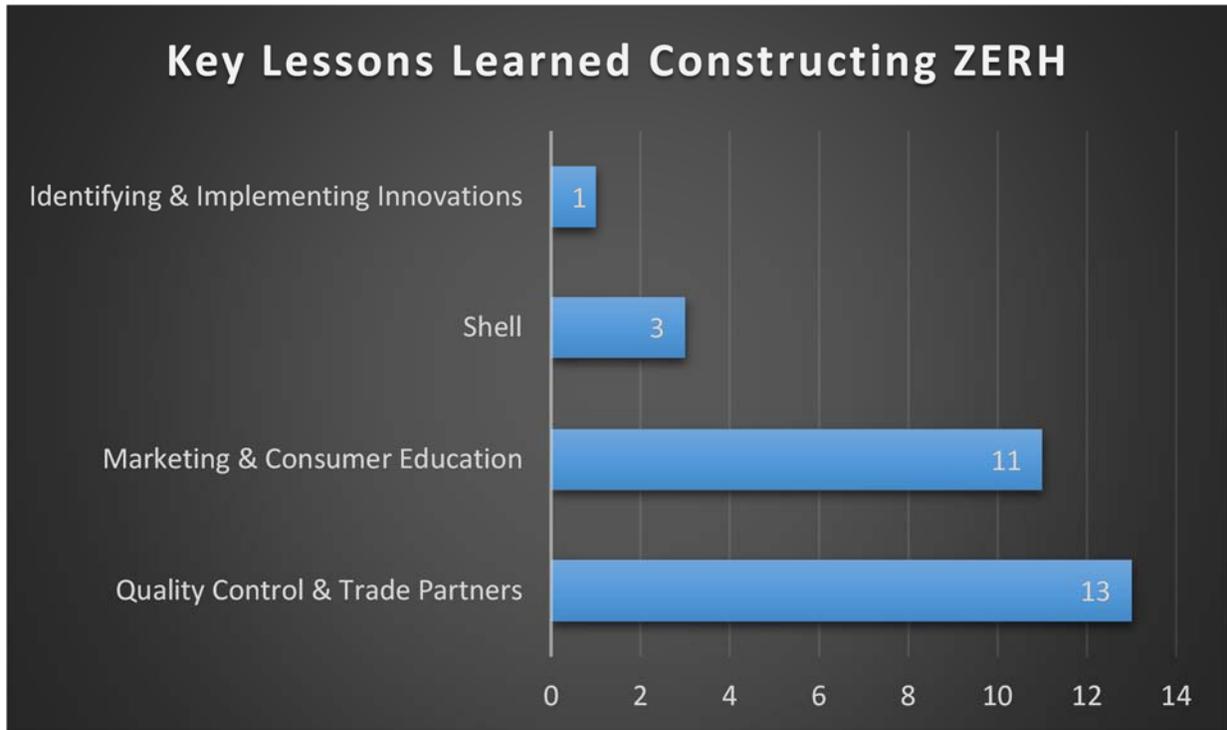
#### Comfort:

- “I never open my windows.” – Homebuyer quote
  - “Hottest days are in the winter with no heat.” – Rater Quote
  - “I have never lived in a house I couldn’t dream of moving out of. Now I do. That’s what engineered comfort means.” – Homebuyer Quote
  - “I don’t know what the temperature is like outside.” Homebuyer Quote
-

## 4 Key Lessons Learned Constructing Zero Energy Ready Homes

The builders discussed key lessons learned and experiences related to the construction of DOE Zero Energy Ready Homes. The group then categorized the lessons learned and voted on the most important categories. The results are summarized in the chart below and shown in detail on the following page.

The Quality Control and Trade Partners category received the most votes (13) while Marketing and Consumer Education was a close second (11). Thus, the key lessons learned identified by builders were less technically focused and more involved with a very challenging labor market and need for effective solutions communicating the benefits of high-performance homes.



## Key Lessons Learned Constructing Zero Energy Ready Homes

Category	Lessons Learned	Votes
<b>Quality Control and Trade Partners</b>	<ul style="list-style-type: none"> <li>• Learned that training subs and employees is crucial to success but difficult – especially in our area</li> <li>• Must invest in your trade partners</li> <li>• Must have a higher level of supervision on site. Field managers must be trained and passionate about building a better product.</li> <li>• Expectations and in process supervision are key. Tough to redo some of the most important things.</li> <li>• Making it easier for the builders to understand and get through the countless checklists</li> <li>• Getting subs to jump on board</li> <li>• Sub-contractors need to be competent and willing and fair-priced.</li> </ul>	<b>13</b>
<b>Marketing &amp; Consumer Education</b>	<ul style="list-style-type: none"> <li>• Marketing to a 36 year old mother of 3</li> <li>• Commitment and dedication to Zero Energy Ready</li> <li>• Have to educate public</li> </ul>	<b>11</b>
<b>Shell</b>	<ul style="list-style-type: none"> <li>• New techniques to super insulate and improve air tightness</li> <li>• Advanced wall construction</li> <li>• Exterior insulation</li> </ul>	<b>3</b>
<b>Mechanical &amp; Equipment</b>	<ul style="list-style-type: none"> <li>• Efficient hot water distribution</li> <li>• Design of high performance HVAC Systems (1 individual vote)</li> <li>• Aligning “Right” amount of air sealing with an effective ventilation system</li> <li>• How difficult it was to do it right without proper ventilation equipment from construction industry. Ventilation options are not designed for homes this tight.</li> </ul>	<b>1</b>
<b>Identifying &amp; Implementing Innovations</b>	<ul style="list-style-type: none"> <li>• Constantly looking for new materials</li> <li>• Constantly reading articles on new products</li> <li>• Getting energy load down so we can install solar @ lower costs</li> <li>• How incredibly easy it was to build Zero</li> <li>• That we needed to do it, that we could do it, and that it was really easy!</li> <li>• Passive House Concept + Low Energy/Efficient Mechanical Systems + Solar Panels = Net Zero...again and again and again</li> <li>• Accept and be willing to change</li> </ul>	

## 5 Key Challenges Moving Forward with Zero Energy Ready Homes

Builders were then asked to identify key challenges moving forward. The group organized these challenges into categories and voted on the priority categories. The results are summarized in the chart below and shown in detail in the table on following page. Note that marketing and communications efforts (Improving Valuation and Marketing categories) received 9 combined votes and business efficiency issues (Streamlining and Growth categories) received 11 combined votes.



## Key Challenges Moving Forward with Zero Energy Ready Homes

Category	Lessons Learned/Challenges	Votes
<b>Streamline Process – Business and Construction</b>	<ul style="list-style-type: none"> <li>• Streamline offering, messaging, systems, etc.</li> <li>• Streamline production methods</li> <li>• Learning better methodologies – ways to accomplish higher results at same or less cost</li> <li>• Reducing our costs to build high performance</li> <li>• More cost-effective systems for zero</li> </ul>	<b>8</b>
<b>Improving Valuation of ZERHs</b>	<ul style="list-style-type: none"> <li>• Banking to look at future value</li> <li>• Getting the MLS to accept it as a value in dollars</li> <li>• Getting information regarding the merits of the Zero Energy Ready Program (differences of high performance in general) out to others in local industry: Building code officials, bankers, appraisers, real estate agents (the tough one) in order to help with realization of value.</li> <li>• Realtors, bankers, consumers understand measurable benefits</li> </ul>	<b>6</b>
<b>Marketing</b>	<ul style="list-style-type: none"> <li>• Effective marketing to target market</li> <li>• Remain profitable, increase exposure to market plan, social media</li> <li>• Work to harness marketing to further differentiate ourselves</li> <li>• Effectively market and sell our speculative homes and the Zero Energy Ready Home idea to custom clients</li> </ul>	<b>3</b>
<b>Growth</b>	<ul style="list-style-type: none"> <li>• Growing and finding the ability to produce more</li> <li>• Key challenge is to make more money building homes this way</li> <li>• Expand NZE model into live work, apartments, small commercial</li> </ul>	<b>3</b>
<b>Education and Training</b>	<ul style="list-style-type: none"> <li>• Subs all-in training commitment</li> <li>• Educating – Subs, employees, homeowners</li> <li>• Replicate knowledge to builder’s team</li> <li>• Code IRC 2012 is closing the gap</li> <li>• Key challenge is to train employees to do what management does. Further challenge is limiting employees to keep costs down.</li> <li>• Rater knowledge in new markets</li> <li>• Trade base – education and quality control</li> </ul>	<b>3</b>
<b>Monitoring and Reporting</b>	<ul style="list-style-type: none"> <li>• Key Challenge moving forward: need more monitoring and reporting.</li> <li>• We need credible 3<sup>rd</sup> party collecting data from our homes</li> </ul>	<b>2</b>
<b>Rater Partners</b>	<ul style="list-style-type: none"> <li>• Rater partners needed to effectively build Zero Energy Ready Homes</li> </ul>	
<b>Multifamily</b>	<ul style="list-style-type: none"> <li>• Entering the apartment building/retail zero energy market</li> </ul>	

## 6 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. This feedback is shown in the table below. DOE will report back at the Fourth Leading Builder Roundtable on how well it was able to address these suggestions.

Category	DOE Actions
<b>Marketing Tools</b>	<ul style="list-style-type: none"> <li>• Allow DOE Zero Energy Ready Home homeowner brochure to be more customizable</li> <li>• Provide builders with info-graphics as individual images from homeowner brochure</li> <li>• Provide Logos/graphics for DOE Zero Energy Ready Home like those in National Green Building Standard silent sales person</li> <li>• Develop homeowner tips for living in a DOE Zero Energy Ready Home – able to be exported into builder materials</li> <li>• DOE Zero Energy Ready Home training for homeowners</li> <li>• Customizable page behind each manual page of homeowner manual</li> <li>• Consumer marketing tools – YouTube videos, web portal/homeowner section</li> <li>• YouTube videos about how it feels – builders share through DOE</li> <li>• DOE to build the brand/blow the horn – market, brand, promote, support DOE Zero Energy Ready Homes</li> </ul>
<b>Networking</b>	<ul style="list-style-type: none"> <li>• Create a DOE Zero Energy Ready Home LinkedIn group</li> </ul>
<b>DOE Communications</b>	<ul style="list-style-type: none"> <li>• Make program email update subject lines specific</li> <li>• Make program newsletters more single-focused</li> <li>• More concise email newsletters with descriptive subjects so reader can “triage” inbox review</li> <li>• Ability to quickly access program updates through website</li> <li>• Send information more often</li> <li>• Send links to information. This often results in action. Otherwise, builder is too busy with day to day info and only accesses program materials when time for rater to certify the home.</li> </ul>
<b>Utility bills and other data</b>	<ul style="list-style-type: none"> <li>• Builder participant offered to share utility bill access letter template with group (DOE to distribute)</li> <li>• Identify method – DOE or other – to aggregate &amp; publish utility bill data (in kWh)</li> </ul>
<b>Appraisals</b>	<ul style="list-style-type: none"> <li>• Push Congress to pass the SAVE act</li> </ul>



## Appendix A: DOE Actions in Response to Second Leading Builder Roundtable Feedback

Feedback Category	Builder Feedback Requesting DOE Actions	DOE Progress
<b>Technologies and Standards</b>	Establish a means to share or disseminate information on efficient products/technologies	Made lessons-learned a key topic at third Builder Roundtable. New LinkedIn group can also address this topic.
	Create or share industry guidance on acceptable temperature and relative humidity range for consumers	Worked with specific builders who had questions on relative humidity and temperature stratification across floors. Also hosted multiple technical webinars on topics including high performance HVAC design, and ventilation design.
<b>Mortgage Leadership</b>	Work with banks to establish preferred terms in mortgages for ZERHs aligned with lower risk	DOE Zero Energy Ready Home launched the Lender Partnership that can be used with all homes certified compliant with Zero Energy Ready Home, ENERGY STAR, and PHIUS Passive House. For certified homes, lender partners are committed to providing a 'Green Appraiser' from the Appraisal Institute list and passing along a completed 'Green Appraisal Addendum Form' provided by the builder to the 'Green Appraiser'.
	Facilitate use of Green Appraisal Addendum Form with sales contract	
	Enhance DOE cooperation with HUD and White House on appraisal and lending processes	DOE continues to look for opportunities.
<b>Education and Outreach</b>	Increase communication on sales and other training opportunities	Frequent Newsletters on Training Opportunities Held multiple webinars and classroom trainings on sales process
	Create a Housing Industry blog or online forum for ZERH builders	Launched DOE Zero Energy Ready Home LinkedIn Group
	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>	DOE has developed Guidelines for Building Science Education that establish core competency requirements for over 30 workforce classifications including architects/designers. This resource will be further developed in 2016. DOE also continues to work with PHIUS to include ZERH in their program requirements and training.
<b>Branding and Messaging</b>	Write a press release on the roundtable, listing attendees	Roundtable is an internal process to benefit our Zero Energy Ready Home partners and not well-suited for a press release. However, we do publically promote builder recognition such as Housing Innovation Awards. Roundtable participants can also reference this summary report to highlight their participation.
	Create messaging content for builders, including more performance metrics	Created Drop-in Messaging resource – pre-approved quotes applicable to DOE ZERH builders and homes that can be used by partners for outreach and marketing
	Increase DOE messaging and awareness to consumers	Created and launched to DOE Zero Energy Ready Home Tour of Zero – a consumer-facing portal which allows access to pictures, floor plans, homeowner testimonials and other details of built and certified DOE Zero Energy Ready Homes
	Create education materials for consumers on how to live in ZER Homes	Created the DOE Zero Energy Ready Home Homeowner Manual which explains the core values of the program in a consumer-friendly way, while offering tips and explanations of why their home is different and how to interact with it.
<b>Improvements for Next Roundtable</b>	Dedicate the next meeting to solve predetermined issues from polling group of builders	DOE is considering using this approach for the next Roundtable. The topics for the Third Roundtable were driven by issues and questions third Roundtable focused on identifying partners issues that could be addressed in later meetings.
	Plan more time for discussion and less on presentations	Formatted the Third Leading Builder Roundtable completely around facilitated discussion.

## Appendix B: DOE Actions in Response to First Production Builder Roundtable 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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