

DOE Challenge Home Production Builder Roundtable Report

May 2014



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**DOE Zero Energy Ready Home
Production Builder Roundtable**

January 27 and 28, 2014
Denver, Colorado

Prepared for
The U.S. Department of Energy's Building America Program
Office of Energy Efficiency and Renewable Energy

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1 Roundtable Attendees

1.1 Participants

- Steve Brown, Carl Franklin Homes
- Bryson Garbett, Garbett Homes
- David Goswick, HouZE
- CR Herro, Meritage Homes
- Karen Hufford, LifeStyle Homes
- Larry Hufford, LifeStyle Homes
- Jordan Luhn, LifeStyle Homes
- John McLinden, StreetScape Development
- Gene Myers, New Town Homes
- Sam Rashkin, U.S. Department of Energy
- Bill Rectanus, New Town Homes
- Tow Wade, Palo Duro Homes (invited)
- Paul Zanecki, Nexus Energy Homes (invited)

1.2 Observers/Staff

- Michael Gestwick, National Renewable Energy Laboratory
- Cheryn Metzger, National Renewable Energy Laboratory
- Joe Nebbia, Newport Partners
- Lindsay Parker, Energetics Incorporated

1.3 Sponsors

- Chris Gibson, Owens Corning
- Shawn Intagliata, Unico
- Frank O'Brien-Bernini, Owens Corning

2 Roundtable Overview

2.1 Purpose

A small contingent of our nation's leading production builders is leading a movement to widespread adoption of Zero Energy Ready Homes (ZERHs). Overall, the industry is slow to embrace major innovations enabling 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. American homebuyers now have easy access to homes that support better lifestyles, superior system performance, and longer life cycles; and these same homebuyers never have to worry about significant utility expenses, thanks to the DOE Challenge Home label.

This meeting was intended to serve as a historic gathering of the top executives from these leading builders to share business and technical lessons learned, identify a list of common challenges faced delivering 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 in active discussion. This report documents the key results. The U.S. Department of Energy (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 from 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 Roundtable Agenda

Table 1.

Day One Agenda: Zero Energy Ready Home Industry Leader Overview		
Time	What	Who/How
8:00 – 8:30 am	Continental Breakfast and Networking	
8:30 – 8:50 am	Meeting Review/Agenda /Introductions What hard trends most impact your company?	Sam Rashkin Around the room
8:50 – 9:10 am	Why Zero Energy Ready is the Home of the Future	Sam Rashkin
9:10 am – 4:30 pm	Leading ZERH Production Builder Presentations: <ul style="list-style-type: none"> • Product Description • Technical lessons learned constructing ZERHs • Business decision making process leading to ZERH • Business lessons learned for delivering ZERH • Business metric results from selling ZERH 	25–30-minute presentations; 10–15 minutes for questions/discussion
9:10 – 9:50 am	Palo Duro Homes (NM)	Sam Rashkin for Tom Wade
9:50 – 10:30 am	Nexus Energy Homes (MD)	Sam Rashkin for Paul Zanecki
10:30 – 10:40 am	Break	
10:40 – 11:20 am	Garbett Homes (UT)	Bryson Garbett
11:20 am – Noon	New Town Homes (CO)	Gene Myers
Noon – 1:00 pm	Lunch	
1:00 – 1:40 pm	StreetScape Development (Chicago)	John McLinden
1:40 – 2:20 pm	HouZE Homes (Houston)	David Goswick
2:20 – 2:30 pm	Break	
2:30 – 3:10 pm	Meritage Homes (Southwest)	CR Hero
3:10 – 3:50 pm	Lifestyle Homes (FL)	Larry Hufford
3:50 – 4:30 pm	Carl Franklin Homes	Steve Brown
4:30 – 4:45 pm	Wrap-up Day 1: Key Take-Aways	Discussion
Day Two Agenda: Zero Energy Ready Homes Moving Forward		
8:00 – 8:30 am	Continental Breakfast and Networking	
8:30 – 8:40 am	Day Two Meeting Review/Agenda	Sam Rashkin
8:40 – 11:00 am	Day One Summary: Key Business & Technical Lessons Learned	Joe Nebbia Discussion/Agree
8:00 – 8:30 am	Continental Breakfast and Networking	
8:30 – 8:40 am	Day Two Meeting Review/Agenda	Sam Rashkin
8:40 – 11:00 am	Day One Summary: Key Business and Technical Lessons Learned	Joe Nebbia Discussion/Agree
11:00 – 11:15 am	Break	Provided
11:15 – 11:40 am	How Innovative is Your Company?	Spider Diagram
11:40 am – Noon	Actions for Improvement That You Will Apply to Your Business	Review Spider Diagrams Around the Room
Noon – 12:20 pm	What Challenge Home Can Do Better	Brainstorm
12:20 – 12:30 pm	Wrap-Up/Meeting Review/Future Meetings?	+/-
12:30 pm	Adjourn	

4 Builder-Identified Trends Affecting Zero Energy Ready Homes

The attending builders were asked to identify the hard trends they had observed, which define a visible future for housing substantially aligned with ZERHs. These trends are listed in the table below.

Table 2.

Category	Trend
Transaction Process	The growing importance of financial processes in recognizing long-term benefits <ul style="list-style-type: none"> • The SAVE Act • The Appraisal Institute’s Green Addendum Form • Certified Green Appraisers
	The need for metrics that validate increased value for high-performance homes <ul style="list-style-type: none"> • Data and metrics in the hands of decision makers, influencers, and consumers
Energy	Increasing energy prices, as well as increasing prices of other resources (water)
	Negative solar trends <ul style="list-style-type: none"> • Less availability of solar leases and solar tax credits • Need to shift demand to reduce utility peak power demand • Increasing utility resistance to purchasing electricity from solar systems at retail rates
	Photovoltaic (PV) will dominate the market as an important technology in new homes <ul style="list-style-type: none"> • "PV" is not a powerful marketing term
Performance	The need to connect high performance with durability <ul style="list-style-type: none"> • Examples of failed energy efficiency projects built without complete building science
Innovation	Increased cost of standard framing techniques compared to alternatives <ul style="list-style-type: none"> • Structural insulated panels (SIPs) – more cost-competitive as more rigorous codes and labeling programs hold conventional framing systems to increased quality installation specifications
Sales/ Marketing	Growing need to adjust marketing techniques for energy efficiency and high performance as builders continue to meet more rigorous program requirements <ul style="list-style-type: none"> • Need to increase consumer-perceived value
	Interest in the word "Zero" <ul style="list-style-type: none"> • Resonates with consumers, although some consumers are reluctant to believe “zero” is a reality

5 Obstacles to Zero Energy Ready Homes

The following table summarizes key obstacles builders have confronted and/or continue to address with the move to ZERHs.

Table 3.

Category	Obstacles
Technical Obstacles	<ul style="list-style-type: none">• Lack of proven ventilation solution for hot/humid climates• Inaccuracies in modeling software predicting actual utility bills and energy savings• Inability for software to effectively model performance contributions of innovations (e.g., thermal mass, heat pump water heaters, waste heat recovery)
Marketing Obstacles	<ul style="list-style-type: none">• Lack of understanding of how to sell energy efficiency, comfort, health, and environmental benefits• Lack of consumer-focused metrics• Difficulty connecting with real estate professionals as an effective sales force
Financial Obstacles	<ul style="list-style-type: none">• Lack of recognition of value associated with high performance• Large builders pushing out regional builders as they secure most available land

6 Successful Strategies Used by Zero Energy Ready Home Builders

The following table summarizes some of the most effective strategies employed by the leading production builders.

Table 4.

Type	Successful Strategies
Technical	<ul style="list-style-type: none"> • Double 2 x 4 walls • SIPs with vertical integration (manufacture., design, installation) • Advanced heating, ventilation and air conditioning (HVAC) • Strategic air sealing focusing on areas with maximum impact • LED lighting • BEopt– free cost and energy optimization modeling tool from DOE • Controls, automation, and feedback • Building information modeling (BIM) • WUFI for moisture analysis • Working with Building America teams to address technical issues
Marketing	<ul style="list-style-type: none"> • The power of solar – helpful in introducing customers to other performance benefits • Meet Your Neighbor night hosted by builder • Monetary savings – consumers understand dollars • Data provided to customers • Proactively inserting the value into the transaction process • Media coverage • Use of appraisal tools (e.g., Sandia National Laboratory PV valuation tool) • Having customer tell the story instead of builder • Energy efficiency as a market differentiator • Concept renderings in place of photorealism for marketing • Deconstructed home or learning centers
Development	<ul style="list-style-type: none"> • Suburban downtown adjacent infill • Zero energy rentals for revenue and breeder for future customers • Make community part of decision-making process • Modular plan units combined in many ways for customization

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

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

Table 5.

Category	DOE Actions
Independent Verification	<ul style="list-style-type: none"> • Develop certification that will be trusted more than builder marketing efforts • Provide independent cost and performance estimates on DOE Challenge Homes • Promote the DOE Challenge Home label to provide comparisons that builders could not make on their own • Work with modeling industry to more accurately capture innovation performance
Mortgage Leadership	<ul style="list-style-type: none"> • Promote banks providing preferential products for DOE Challenge Homes • Conduct outreach to real estate professionals to gain buy-in • Promote the use of Green Addendum for appraisals • Support the Sensible Accounting to Value Energy (SAVE) Act
Education and Outreach	<ul style="list-style-type: none"> • Deliver sales training • Develop a real estate professional training module • Publish case studies and testimonials – virtual Parade of Homes • Conduct media outreach
Branding and Messaging	<ul style="list-style-type: none"> • Make “U.S. Department of Energy” more prominent in the name/logo • Include "Zero Energy" or "Zero Energy Ready" as part of the program name • Solidify the Zero Energy Ready definition • Expand DOE Challenge Home to gut retrofit projects

8 Builder Business Actions

At the end of the meeting, each builder identified specific actions, identified through the discussions, to bring back to their individual companies. The table below summarizes these key actions.

Table 6.

Type of Innovation	Specific Actions
Technical	<ul style="list-style-type: none"> • Do deep retrofit Challenge Home with veteran workforce and homeowner • Mount solar PV on more than roof, possibly track sun movement • Work on building science technologies • Utilize more effectively tools such as BEopt, 3D software, PV appraisal tool
Marketing/Sales	<ul style="list-style-type: none"> • Leverage consumer awareness with single message from credible voice • Focus on the consumer's story • Leverage the power of “zero” • Shift from educating to motivating – emotional sales approach • Show low energy bills to customers aggregated over 30-year mortgage • Reduce quality assurance issues, creating more customers that will sell for the builder • Work on succinct benefit messaging • Develop new brand for ZERHs • Implement better storytelling on website • Create the big story – compare existing and new home in the same neighborhood
Transaction Process	<ul style="list-style-type: none"> • Collaborate with industry on appraisal and mortgage challenges • Work closely with industry influencers, appraisers, real estate agents • Learn about the SAVE Act and how to work with appraisers
Leveraging Resources	<ul style="list-style-type: none"> • Work with a Building America team to achieve higher performance • Work with DOE and manufacturers to improve performance • Use an online forum for sharing ideas between leading builders • Do a better job leveraging third-party resources for training • Raise the bar on personal technical knowledge

9 Next Steps

All attendees agreed that the discussion was extremely useful. Numerous follow-up actions were identified.

Table 7.

	Follow-up Actions
DOE Next Steps	<ul style="list-style-type: none">• Enhance program messaging• Establish independent data• Lead mortgage/appraisal outreach• Support sales and real estate professional training
Builder Next Steps	<ul style="list-style-type: none">• Implement roundtable lessons learned• Promote DOE Challenge Home• Build and certify homes• Partner with a Building America team• Continue to engage DOE Challenge Home staff with technical or program questions
General Next Steps	<ul style="list-style-type: none">• Continue communication• Consider timing, location, topics for next meeting

Appendix A: DOE Response to Requested Program/Logo Change

Builders attending the Roundtable meeting expressed consensus supporting one suggestion for improvement to the DOE Challenge Home program: to change the name from Challenge Home to one that captured the growing market interest in zero energy ready performance. There was also significant interest in making the U.S. Department of Energy name more prominent in the logo. Working with DOE executives and a brand manager, a new draft logo (shown below) was developed in response. The program name has been changed from Challenge Home to Zero Energy Ready Home and uses a larger font for the word “Zero,” identified as a significant power word. The U.S. Department of Energy name was kept the same size; in versions of the logo in which the font was increased, the logo was judged too busy. This draft logo is now being submitted to the brand consultants working with DOE; they will develop an official final version and submit it to the trademark process.



Figure 1. New Zero Energy Ready Home Logo

Appendix B: 2014 RESNET Annual Conference Builder Panel

Two weeks following the Leading Builder Roundtable, five ZERH builders gathered for a panel at the 2014 RESNET Annual Conference: Addison Homes, Imery Homes, KB Homes, Preferred Builders, and Stitt Energy Systems. They presented an impressive array of lessons learned constructing ZERHs; the lessons learned are provided in the table below.

Table 8.

Category	Lessons Learned
Construction Process	<ul style="list-style-type: none"> • Setting up an integrated team enables minimized defects and waste. • Initially conducting more than the standard two HERS field inspections is valuable for ensuring smooth compliance with DOE Challenge Home. • A systems approach and attention to details are critical for high-performance homes. • Having an in-house HERS Rater/Building Science capability is vital for integrating building science from the beginning of the construction process vs. only inspecting at the end. • Consistent standards are needed. • Advanced framing can prevent some structural performance issues. • An in-house infrared camera is a great way to enforce standards.
Marketing/Sales	<ul style="list-style-type: none"> • High-Performance is a unique marketing differentiator. • Independent verifications provide a significant sales benefit. • Actual billing data can be used to sell performance. • Exceed customer expectations. • Effective “Power Words” are essential to communicate value. • Explaining why you build is critical to selling homes.
Business	<ul style="list-style-type: none"> • There is an accelerating need for change. • Measure actual utility billing data to verify performance. • An “open house” during construction with local builders and the Home Builders Association (HBA) is an effective way to sharing innovative practices and help lead change. • Technical challenges should not block progress; DOE Challenge Home responds to reasonable concerns quickly. • Zero energy ready ensures affordability; if homeowners do not pay the utility bill, the utility will stop service, whereas non-payment of the mortgage entails a much longer process before action. • Not sacrificing investment in high-performance “brand” during tough market conditions enabled faster growth during the recovery. • Employees and trade partners are increasingly buying in to the mission of high-performance builders. • Having reputations as sustainable builders opened up business opportunities that would otherwise not have been offered.

Appendix C: DOE Actions in Response to Builder Feedback

Table 9.

Feedback Category	Builder Feedback Requesting DOE Actions	DOE Progress
Independent Verification	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 Challenge Home Cost and Savings performance estimates and posted them on the Challenge Home 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 Challenge Home performance to minimum code 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.
Mortgage Leadership	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 the appraisers get the Green Appraisal Form.
	Promote the use of Green Addendum for appraisals	DOE will seek a presence at real estate industry events and start a sales training program in the summer of 2014 (see below).
	Conduct outreach to real estate professionals to gain buy-in	DOE cannot lobby on behalf of any legislation but will continue to offer any technical assistance as needed.
	Support the SAVE Act	The sales training curriculum is complete, and program delivery will start the summer of 2014.
Education and Outreach	Deliver sales training	A 45-minute presentation will be developed for real estate conferences; staff will look for the best venues.
	Develop a real estate professional training module	Templates are being developed, and website design is in progress. The key to launch is getting critical mass of ZERHs certified and profiled.
	Publish case studies and testimonials – a virtual Parade of Homes	Media outreach is a continuous effort for DOE. Staff will provide a list of all media placements on the ZERH website.
	Conduct media outreach	Per guidance from builders, DOE staff immediately secured a name change from Home Challenge to the DOE Zero Energy Ready Home with a revised logo. Once the brand consultant has provided the final graphics, there will be a formal announcement and a post on the website.
Branding and Messaging	Make U.S. Department of Energy more prominent in name/logo	As above.
	Include "Zero Energy" or "Zero Energy Ready" as part of the program name	DOE will continue participating in the Net-Zero Energy Home coalition to secure a definition with all stakeholders.
	Solidify the Zero Energy Ready definition	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.
	Expand DOE Challenge Homes to gut retrofit projects	DOE staff has informed Building America management that teams should consider top Challenge Home 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.
Building America	Help create opportunities to work on research projects with the world-class experts from Building America	

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