U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

DOE Zero Energy Ready Home

Fourth Leading Rater Roundtable Summary

May 2019

ZERO ENERGY READY HOME
U.S. DEPARTMENT OF ENERGY

Building America
U.S. Department of Energy

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Fourth Leading Builder Roundtable Summary

February 27th, 2019
New Orleans, LA

Prepared for

DOE Zero Energy Ready Home Program

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May 2019

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Introduction

A dramatic movement to zero energy ready homes is gaining momentum. This includes statewide codes, large developments, and a growing commitment to the DOE Zero Energy Ready Home (ZERH) program. In fact, Zero Energy Ready Home certifications have doubled in each of the past two years. Continued progress will rely on an increasing number of HERS raters effectively bringing the business case, technical solutions, and verification services for Zero Energy Ready Home to our nation's builders. The Zero Energy Ready Home Program Rater Roundtable Meeting is our opportunity for the program to hear directly from raters in the field on what they are seeing, what is working with the program as well as challenges, and opportunities going forward. Zero is too important to fail, so it is critical that DOE listens (and learns) to HERS Raters who deliver the program to builders.

This year's meeting was held at the 2019 RESNET Conference in New Orleans, Louisiana. This interactive meeting was a part of the conference's main program and open to any and all high-performance home raters to participate, as well as to other interested stakeholders as observers. The following report provides a summary of the discussion including:

- Current trends in the home building industry
- What's working with ZERH and other high-performance programs
- What are the challenges these raters are facing
- What opportunities does DOE have to better serve the rater community and help drive the growth of ZERH

Meeting Plan

Purpose:

Zero Energy and Zero Energy Ready Homes continue to make headway into the US housing market. The DOE Zero Energy Ready Home (ZERH) program has doubled certifications for three straight years, total zero energy and zero energy ready homes in U.S. and Canada doubling from 6,000+ to 12,000+ from 2015 to 2017, and an increasing number of city and state commitments. Continued progress will rely on an increasing number of Home Energy Rating System (HERS) raters effectively bringing the business case, technical solutions, and verification services for Zero Energy Ready Home to our nation's builders. At this meeting, a select group of HERS raters will gather and share lessons-learned and key challenges moving forward moving the housing industry to high-performance homes

Desired Outcomes:

- List of key lessons-learned by HERS raters promoting and verifying ZERH
- List of key challenges moving forward engaging builders to participate with ZERH
- List of what DOE can do to better support HERS raters promoting and verifying ZERH
- Enhanced ability for raters to add builder value by leveraging Building America Solution Center

Agenda:

Time	What	Who/How
10:30 – 11:00 am	Meeting Review/Agenda /Introductions "Biggest 2019 Housing Trends" HERS Raters Observing	Sam Rashkin Around the Room
11:00 – 11:20	State of 'Zero' – Key ZERH Program Developments • Growth • Automated Reporting (No Rater Quarterly Reports) • Specification Updates • National Consumer Awareness Campaign • New Tools/Resources	Sam Rashkin
11:20 – 12:00 pm	What's Working with ZERH and High-Performance Programs • List • Sort/Prioritize top Wish List Items	Cards/Sorting N/3
Noon – 1:30 pm	**Lunch Provided by RESNET**	
1:30 – 2:00 pm	Key Rater Business Challenges for 2019 • List Challenges • Sort/Prioritize top challenges	Cards/Sorting N/3
2:00 – 2:50 pm	Key Opportunities for HERS Raters to work with DOE ZERH Upserving 1,000s of Builders at/near Program Requirements • List all opportunities • Sort/Prioritize top 3 opportunities	Cards/Sorting N/3
2:50 – 3:00 pm	Wrap-Up/Summary	Sam Rashkin, +/-

Trends in the Home Building Industry

As a kick-off to the meeting and to get everyone involved in the discussion, the first activity asked participants to introduce themselves and give us the top trends they currently see in the home building industry. Even with raters serving a variety of markets and builder types, many of the trends identified were repeated or confirmed by several different participants, indicating that many of these are national trends, not specific to one rater or one location. The first trend many highlighted was the growing interest in high-performance home building programs, and often specifically in ZERH. Several factors contribute to this including: the builder's desire to differentiate themselves, incentives from utilities and energy efficiency programs, and getting high-performance programs such as ZERH in state QAPs.

With this increased interest, more education and awareness is critical in order to ensure successful growth. Education on code requirements, high-performance building standards, and best practices when building to ZERH and other high-performance programs is necessary for builders and trade contractors. Many indicated that health and wellness are becoming increasingly more important to buyers and they are more educated on what is a healthy home. Builders can use ZERH and other programs as a risk management strategy and to promote healthy living features in their homes.

Other trends include the increase in multi-family buildings that has been prevalent across the building industry for the past couple years. More townhomes, retail and residential combination buildings, and larger multi-family buildings are being constructed. In general, many seemed to think higher density housing is becoming far more common across the industry. There is also a growing trend amongst high-performance builders in going to all electric homes, although some indicate there is still a little hesitation.

Trends in the Home Building Industry	
Category	**Trends**
Interest in High-Performance	• A lot more smaller builders trying to use ENERGY STAR and/or ZERH to differentiate • Growing interest in ZERH builders • Incentives are a big driving factor • 2% of green certified homes in NW will be ZERH likely driven by Oregon Governor's Executive Order to have ZERH as code by 2023 • HUD Funding and other programs are often driving factors for participating in high-performance programs • Trend towards more high-performance program participation driven by State QAPs (PHIUS) • Custom home builders are becoming more interested in ZERH
Multi-Family	• Seeing more townhouses, triplexes • Higher density housing is becoming far more common
Electrification	• Growing trend towards all electric with high-performance builders • Some hesitation on electrification
Education	• Builders and contractors need training on program requirements to deliver on high-performance projects • Increased stringency in Energy Codes and varying levels of enforcement on different versions of the code. Need more education on what is required with new codes. • ZERH should interest builders from a risk management stand point. More education on program requirements and how to get there would increase builder interest. • Health and wellness are increasingly more important and educated more on how high-performance buildings achieve that is critical
Challenges	• Train unqualified sub-contractors • Finding a QA Certified Contractor can be a poison pill • Builders always think they have to put PV on the homes. • Integrating all the controls (music, lighting, leak detection, etc.) • No incentives in some markets

What's Working with ZERH and other High-Performance Programs

For the next module, participants were asked about their current experience working with the ZERH program and/or other high-performance programs. Raters were asked to discuss some of the things they liked about the program and what aspects of the programs are working well for them. The majority of the conversation in this module focused on the simplicity of the program. Simplicity included things like minimal extra paper work and integration with software providers (REM/Rate) for a simple submission process, to leveraging other programs via the stair step method by using these other programs as pre-requisites. This stair step method helps to allow for the simpler certification process by not bogging down builders and raters in extra checklists, definitions, and requirements that may or may not be aligned. It makes ZERH an easy option for someone who is already familiar with ENERGY STAR.

Another aspect of the program the group discussed was marketing and outreach. Many indicated they have used the marketing toolkit available to them in their partner profile and that the ZERH program has an effective suite of materials they can draw from. Several raters followed up previous statements that interest in growing and more builders are asking about ZERH. Builders are finding that differentiating themselves through high-performance programs is an effective solution, particularly in areas where the energy code is already strong.

What's Working with ZERH	
Category	**What's Working**
Marketing/Outreach	• Differentiates high-performance especially in a market with strong energy code • Creating an interest. More builders are asking about ZERH

Stair Step	• Leveraging…
	  o ENERGY STAR
	  o WaterSense
	  o IAP
	  o PHIUS
	• Ease of explanation….ZERH is ES+. Makes sense to ENERGY STAR partners.
	• Builds on other successful programs such as ENERGY STAR
	• ZERH is a good step to PHIUS. Good requirement framework.
	• Easy option is familiar with ENERGY STAR

Simplicity	• Easy Concept….zero energy bill (sort of) • Minimal extra paperwork • Streamlined checklists and RESNET registry integration makes it easy to report • Checklists & paperwork are easy • Integration with software (REM/Rate) • Ducts/HVAC systems in conditioned space • Simple submission process

Rater Challenges in the Year Ahead

After discussing some of the successful aspects of ZERH and other high-performance building programs, we asked the raters to point of some of the challenges or obstacles they face in the field. Several of the topics discussed during this module were related to some of the trends identified in the first part of the meeting. For example, incentives and financing drying up is a big challenge because that is often a driving factor for builders. Most energy efficiency rebate and financing programs have expiration dates and aren't always extended which makes efforts to continue to push these utility funded programs, get ZERH into state QAPs, affordable housing programs, and exploring other channels is critical for continued growth.

Educating all industry professionals (builders, trades, architect, engineers, code officials) on not just requirements for ZERH and high-performance building best practices, but also on basic code requirements was also discussed at several different points throughout the meeting. It becomes a challenge for raters because there is a wide variety of code adoption and enforcement and as the stringency increases, this only becomes harder. In many cases there are only a few things code officials are looking for and not all requirements are taken seriously. Without a solid understanding of what is required by code, why it's required (building science), and how to comply (best practices) it's almost impossible to start having the conversation about high-performance programs. The lack of consistency in the industry with regards to enforcement of building codes and ratings for high-performance programs is a real problem.

Challenges in the Year Ahead	
Category	**Comments**

Financial	• Incentives and financing "dry up"
	• Housing market on egg shells
	  o Lack of diversity in business
	  o Challenges to get into broader services
	  ▪ Home performance and ZER consulting
	  o Lack of financing for high-performance upgrades (EEM, etc.)

The Unknown	• Black clouds on the horizon • Consistency is lacking • Litigation
Education	• Increased complexity with the codes/program language • Lower aptitude in the building trades
Enforcement/Codes	• Consistency within ratings (QA) • Building official enforcement. All they check for is blower door and duct leakage results • Fractured code adoption adding layers of difficulty in application for codes • RESNET focused on high volume builders rather than fringe high-performance • Simulated & ERI compliance (building officials)

	• If ERI for code becomes main stream

Opportunities Going Forward with ZERH and other High-Performance Programs

After gaining an understanding of what is working and some of the challenges raters face with ZERH and other high-performance programs, the last module was aimed at identifying some opportunities moving forward for growth and helping to support raters in promoting these programs. As discussed previously in the meeting, many raters indicated that incentives and energy efficiency programs/requirements such as utility rebate programs, state QAPs, and stretch codes are key opportunities for growing participation in ZERH and getting more builders eager to participate. A toolkit should be created that helps to engage localities, utilities, and state energy offices that make these decisions. Promoting the benefits of these programs on the local level would be helpful in getting ZERH and other programs included in these incentive and rebate programs.

As discussed in previous sections of the meeting, education and consumer awareness/marketing continues to be an opportunity going forward. More technical education for builders, raters, and trade contractors on ZERH requirements, best practices, and examples/scenarios on how to comply with the requirements would be extremely useful for the industry professionals. On the consumer side, continuing to grow brand awareness by showcasing more case studies and tour of zero profiles will help. Creating more demand from consumers will create demand from builders.

Other opportunities include continuing to simplify the submission and compliance process with streamlined checklists. The simplicity of the program was highlighted as a strength earlier in the meeting, but more streamlining is always better in the mind of raters and builders. With the growing trend in multi-family buildings there is also an opportunity to grow the program by encouraging multi-family certifications more. Lastly, some technical opportunities included items such as requiring balanced mechanical ventilation and providing technical guidance on best practices for heating and cooling systems and duct work.

Opportunities Going Forward	
Category	**Opportunities**

Technical	• Require balanced mechanical ventilation
	• Help to develop technical guidance on ducted mini-splits
	  o Ducts in conditioned space
	  o Electrification

Local Incentives/Interactions	• Pushing codes & incentive programs to include ZERH
	• Promoting the benefits of program(s) compliance to municipalities (local level)
	  o Mayors
	  o Town Supervisor
	  o Boards/Legislatives
	  o Building Code Officials
	  o Builder Assocations
	• Create a toolkit for engaging localities, utilities, state QAPs
	• More utilities to provide incentives for ZERH certification
	  o Lots in CT but few in MA
	  o $100-$300 as a simple motivator

	o Grant opportunity to spur market • ZERH as stretch code o Directed towards state energy offices & utilities • Local outreach/toolkit o Local incentives o Toolkit for regional, mayors, policy makers, non-profits
Simplification	• Integrated checklists/requirements documentation o While the building blocks are easy to put together, it can be overwhelming to a builder • Influence the Rater PRO team to add a full ZERH option in the software. Unified UX (user experience) to walk through with PMs and site supers
Multi-Family	• Include dorm style housing • Push multi-family
Education/Tools	• Interactive trainings • More software companies to include reports showing ZE scenarios with projected HERS index and cost savings • Excel based tool which integrates checklists, footnotes and field verifications • Advanced guidance for raters to account for PV/ZERH
Consumer Outreach & Marketing	• Easy access to regional case studies (filter/search by location and size) • Marketing directed towards architects o We need to reach more architects • Brand recognition continues to be a challenge o Some builders want Zero but why do they need ZERH?

Appendix A: DOE Actions in Response to Second Leading Rater Roundtable Feedback – 2018

Feedback Category	Rater Feedback Requesting DOE Actions	DOE Progress	Grade
City/Code/Utility Involvement	• Make ZERH an alternative to code compliance and utility incentive programs • Reach out to cities and utility energy efficiency decision makers to make ZERH required or rewarded • Engage cities and states to spec ZERH for low income homes of spec subdivisions • Get ZERH into QAPs	• Support Oregon Executive Order for 2023 ZERH code • Outreach to Net Zero Carbon cities in U.S • Developed and Posted Fact Sheet for State QAPs • Posted ZERH Incentives Summary from Utility Programs, State QAPs, and other sources- Updated Regularly	**B**
Marketing	• Link to indoor air quality studies • Less missed work/school • Fewer building maintenance and call backs • Tenant retention • Pump-up builders in markets where ZERH is prevalent - Get competitive juices flowing • Celebrity spokesperson • DOE logo presence- more DOE! • Get links to program website on all partner websites • Develop high impact content as landing page for web • More social media including Pinterest, Instagram, DOE-TV	• Doe held an Expert Marketing Meeting with marketing reps from various Innovation Partners to discuss messaging, communication channels, and collaborative effort to raise ZERH consumer awareness • Marching orders to form a marketing committee to craft messaging/content, develop distribution plan, and engage more stakeholders • ZERH is currently unable to obtain our own Social Media account but is working in collaboration with a graphics company on developing more shareable content • Consistently working to improve website usability • Developing a more comprehensive consumer facing ZERH page	**B+**
Education	• Engage politicians • Educate at regional utility and financing level • Provide training via social media • Educational sessions at IBS • Training webinars customized - Regional specific issues - Occupant education - Material awareness - Technology advancement - Latest research - Climate specific packages	• Scheduled ZERH for trades webinar • Scheduled ZERH session at 2019 IBS • Scheduled ZERH training at Habitat for Humanity Summit • Scheduled ZERH training at B4 Conference • Provided customized ZERH webinars for builders, developers, and affordable housing stakeholders • ZERH orientation training is mandatory for new partners	**B**

	• Mandatory ZERH training • Certification for ZERH Rater	• Discussion on potential partnership with EEBA for a 'Zero Pro' certification	

Appendix B: DOE Actions in Response to Second Leading Rater Roundtable Feedback – 2017

Feedback Category	Rater Feedback Requesting DOE Actions	DOE Progress	Grade
Strategic Marketing	Work with rater sales team to identify market/builders DOE wants to target Continue to use rater feedback to make improvements to website (Building America Solution Center) to help train sales staff in both with the rater company and builders Provide raters and builders with more advanced training and education on the benefits of energy efficiency programs (training on sales to consumers)	• ZERH White Board Video under development • Engaging NAHB to partner with ZERH builder awards • Option to provide BASC feedback available 24/7 • Invited HERS Raters to ZERH Training Seminars • New ZERH Sales Training	**B**
Value Proposition Data	Regional cost data for "balance of system" – it costs more for x but save on y and z	• Posted ZERH Cost Study for key climate regions more prominently on website	**B**
Builder Engagement	Sell to all levels of a builder organization. Executive, Purchasing, Operations, Warranty, Sales Team Address value proposition and objections through decision and value engineering chain Do focus group work with builder departments that influence ZERH go/no-go decisions (executive, sales/marketing, purchasing, field operations) Better demonstrate the value proposition of raters, inspections, and program (data)	• Actively recruited builders and invited their management team to customes webinars (e.g., LendLease, Caliber, Goodall, Garbett, etc.) • Voice-of-Builder webinars • Set to offer customized webinars for targetsr builders and their management teams: o NZEC survey builders o 100% ES/IAP builders o ES w/ low HERS score	**B+**
Trade Partner Engagement	Train-the-trainer sessions for trades Enhance/ Increase YouTube/Social Media experience	• Invite trades to ZERH training seminars • Coordinate with ENERGY STAR Certified Homes on Quality HVAC requirements and new HERS Grading protocol • Continually add trade images, videos, content on BASC	**C**

	Trade training videos and language options – same video in English, Spanish, etc.		
	Work with HVAC industry to increase knowledge and consequence to avoid poor work. The best pathway for HVAC QA is with HVAC distributors		
	Increase education and outreach to trade contactors to help them better understand the program and the necessary steps to comply with ZERH. The leap isn't that big. Trade Contractor Round Table/Outreach		

Appendix B: DOE Actions in Response to First Leading Rater Roundtable Feedback – 2016

Feedback Category	Rater Feedback Requesting DOE Actions	DOE Progress
Marketing Tools	Plaques for homes	Although the DOE Zero Energy Ready Home program does not have funding to create plaques for each home, we do continue to make available logos and sticker specs so that sticker labels can be created. We have seen builders and raters do creative things with the logo such as create window clings or company vehicle banners using the graphics. Our focus in marketing materials has been to expand drop-in messaging to aid in partner storytelling, as well as developing a consumer video, which is intended to introduce the program, it's message and the Tour of Zero. We have provided active partners with google ad content and guidance to help them in their local market.
	Create Marketing Collateral (Sample radio ads, banners) builder paid	
	Link ZERH brand to convincing storytelling	
	Collaborate with EPA to recognize cities/communities that have "above average" % of Energy Star/ZERH	DOE Continues to work to provide special recognition for communities that have a commitment to DOE Zero Energy Ready Home. This could be in the form of a press release or newsletter highlight on a builder committing to build 100% of a subdivision or development to DOE Zero Energy Ready Home requirements. We also try to highlight large developments that have a certain number or percent of their units that must meet the program specs.
Networking	Provide connections – builders interested in ZERH w/ raters interested in delivering ZERH	We have reached out to raters asking them to set up meeting with their leading builders so that DOE Zero Energy Ready Home staff can partner with the raters to help sell the program to the builder.
Technical Resources	Education and Training: Series of videos on Zero Energy Homes from various perspectives: builder, rater, contractors, homeowner, real estate broker, politicians	DOE started by developing a consumer video to introduce the program and the Tour of Zero. Next steps include improving this video. We have also attempted to collect as much homeowner video testimonials as possible during the Housing Innovation Awards process by encouraging applicants to submit video.
	Develop Architectural Details (the perfect common wall; visual details like ice water in the oven; air barrier details and best construction ideas)	DOE has continued to populate the Building America Solution Center with as much technical details as possible. The BASC points builders toward details required for DOE Zero Energy Ready Home certification. We have also continued host, record, and post online technical webinars.
	Trade-Specific Training: builder sales staff, builder business, appraisals, purchasing, raters, etc.	DOE Zero Energy Ready Home continues to build its library of recorded trainings and have hosted a variety of topics including sales, the appraisal process, rater training. We also have technical webinars for various trades such as lighting design, efficient hot water distribution, and low-load HVAC design.

	Quantify Health	The closest we have come to quantifying health benefits is to compare the number of indoor quality measures in homes built to Zero Energy Ready Home requirements compared to homes built to other program or code requirements.
Program Developments	Create/modify standards for multi-family buildings (i.e. compartmentalization)	DOE has modified the Zero Energy Ready Home standards in several ways to help deal with the differences of multi-family buildings. First, we adjusted the air leakage target in the reference home for all attached dwellings. Next, we adjusted the hot water delivery efficiency requirements to more closely match available multi-family technology. Finally, we adjusted our program to match the Energy Star allowance of buildings up to 5 stories.
	Collaborate/negotiate with EPA to streamline Energy Star (i.e. abridge HVAC requirements to "most critical items only"	DOE and EPA have a continued relationship making sure both programs work together. This is a collaborative relationship and feedback and new approaches are constantly being discussed.
	Application Product Interface (API) – speed data entry for certification process	DOE's focus has been on developing an API on the back end to speed the reporting part of the certification process. This is an ongoing partnership with RESNET to improve automation of DOE Zero Energy Ready Home certification.
Valuation and Value Metrics	Develop a source for the value of high-performance home features (Value propositions blown vs. batt; builder grade vs. triple pane; most common HVAC vs best; most common DHW vs best; resale green vs code, comate zone sortable program spec tool	While DOE must remain neutral on specific products, we do have several training modules based on different ways to get to the spec and discussions of the pros/cons to different approaches.
	Develop offset cost sheets for targeted best practices	While we do have an overall cost analysis that provides a national average cost for building Zero Energy Ready Homes and takes into account cost offsets in the approach, actual cost is so locally specific the developing meaningful cost offset data on specific measures can be difficult.
	Engage insurance industry to recognize ZERH value, especially disaster resistance option	DOE Zero Energy Ready Home does have an ongoing relationship with the insurance industry through IBHS and continues to co-promote the Fortified Home program.
	Convince rational lender	DOE continues to operate its lender partner category for DOE Zero Energy Ready Home and encourages the lending industry adequately value energy efficient and high-performance components and systems in homes.

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