



## **2018 RESNET Building Performance Conference Breakout Session Nominations**

### **Advanced Building Science**

#### **When Building Scientists Experiment on Their Own House**

In an ecosystem where cost-effectiveness is dwindling and construction costs are rising, residential energy efficiency professionals often struggle to prove the value of new approaches. However, when presented with the opportunity to walk the talk, one architect and building science professional from Portland, Oregon, jumped at the opportunity to retrofit her own house with an upgraded envelope, seeking both energy savings and seismic resiliency. In a house already chock full of smart controls and efficient equipment, will these upgrades finally bring this historic home into the 21st century? In this session, the homeowner - who helps design energy efficiency programs by day - will discuss the process of retrofitting her house, incremental costs, and measured benefits. Presenters will also discuss how this project is part of a larger pilot project with other cities, and how additional benefits such as health, comfort, and seismic resiliency could be added into packages of energy efficiency measures in programs.

3 Learning Objectives - "By attending this session, participants will..."

1. Be exposed to a retrofit strategy for walls that offers energy and seismic benefits
2. Understand how an energy expert feels about the non-energy benefits in her own home
3. Learn about strategies that the international Carbon Neutral Cities Alliance is supporting to deal with climate change

Keywords:

Smart home, energy efficiency, energy programs, seismic, resilience, non-energy benefits, building envelope

Session Length:

- 90 minute

Session Format:

- Interactive Lecture

Suggested Presenter(s): Emily Kemper, CLEAResult & David Heslam, Earth Advantage

## **Durability, Resilience and Energy Efficiency: Working together to make sustainable building envelopes.**

As building, energy and green codes become more stringent, new building technologies and innovations are being incorporated into the building envelope. When incorporating new technologies into building assemblies traditional construction practices need to be adapted. However, as these adaptations of construction practices take place they still need to maintain adherence to basic principles of water management to prevent moisture accumulation in building assemblies. This presentation will describe some of the water management challenges and choices that arise when increasing the thermal performance of building. The presentation will include a review of the progress of industry standard practice and guideline development on the development of details to maintain air, water and thermal barrier continuity and integrity.

Suggested Presenter(s): Theresa Weston, DuPont Protection Solutions

## **The When and Where of Vapor Retarders**

Code provisions on the use and placement vapor retarders are becoming more detailed and can be confusing. Additionally, building assembly components such as water-resistive barriers, air barriers and sheathings are available as either vapor retarding or vapor permeable products. Moreover, new products with variable permeability, sometimes referred to as smart vapor retarders, are being introduced into the market. In 2015 the concept of using hygrothermal modeling to determine the use and placement of vapor retarders was introduced into the International Building Code (IBC). This presentation will review changes to the vapor retarder requirements in the IBC and the IRC from 2009 to 2018. It will introduce hygrothermal modeling and provide guidance on the key considerations when conducting or reviewing a hygrothermal analysis.

Suggested Presenter(s): Theresa Weston, DuPont Protection Solutions

## **Battle of the Complexness**

Which are better, smart homes, or resilient homes? Which houses are more attractive to homeowners? Which are more attractive to contractors looking to boost their renovation / new construction business, and attract new customers who are interested in energy savings? Would you be surprised to find out that they are one in the same? In this session, two residential energy efficiency experts and building science "enthusiasts" will go to the mat in defense of their preferred strategy for future-proofing houses and delivering benefits to homeowners. In this battle, everyone wins. Learning Objectives include: 1) Translate Resiliency and Smart Home Features into homeowner Benefits 2) Identify features that fit well

into both resiliency and smart home approaches 3) Ensure that builder preferences allow for at least some resiliency and smart home approaches

Suggested Presenter(s): Dan Wildenhaus CLEAResult & Emily Kemper, CLEAResult

### **Emerging “Smart” Ventilation Strategies and ASHRAE 62.2-2016**

This session will explore emerging technologies in smart whole-house ventilation and how these systems could reach maximum potential in hot and mixed-humid climate zones and lessen industry pushback on fresh-air and tight building requirements. Time-varying control strategies are designed to optimize ventilation run-time by controlling function based on variables such as outdoor temperature, relative humidity, and/or pollutant levels, or by taking advantage of off-peak grid hours or occupancy. Presenters will dive into research findings, in order to analyze predicted benefits, such as increased energy savings and indoor air quality. Additionally, presenters will demonstrate the power of ASHRAE 62.2-2016 and how Appendix C can be utilized in order to demonstrate compliance for these high performance, time-varying systems.

Suggested Presenter(s): Jenna Grygier, Southface; Mike Barcik, Southface & David Pedrick, Southface

### **The Power of Monitoring**

If you don't know what you don't measure, then knowledge equals the power of energy savings and improved indoor air quality (IAQ). Building monitoring is the best method of unveiling real-time hidden behavior, IAQ, comfort and energy consumption. This session will dive into case studies and lessons learned in result of Southface research efforts, including a variety of residential and small commercial applications. Attendees will also gain an understanding of monitoring best practices and the technology of monitoring equipment in the market today.

Suggested Presenter(s): Jenna Grygier, Southface; Mike Barcik, Southface & David Pedrick, Southface

### **The DOE Energy Code Field Study: Assessing Energy Impacts and Air-leakage in Multifamily Buildings**

Envelope air leakage tests have been developed to help reduce energy use and improve IAQ for multifamily units, but there is a lack of consensus on the best methods for targeting lower energy use. This session will review the various test methods, what they measure, and how the results provide information related to energy use and IAQ concerns. Results will be presented from various studies that show the relationship between exterior and total unit leakage. Presenters will also provide an overview of the current DOE energy code field

study for multifamily buildings, which will include extensive leakage measurements across various building configurations, as well as describe the test plan and preliminary results.

Suggested Presenter(s): Jeremiah Williams, Department of Energy & Benjamin Hannas, Ecotope, Inc.

### **Measure Twice, Cut Once: Design Charrettes Lead to Better Buildings**

Top builders can achieve high efficiency buildings with minimal or even zero incremental costs by adopting an effective, intentional, and dedicated integrated design process. Design charrettes are a critical aspect of this process. They bring the entire project design and construction team together, codify the project's energy efficiency goals, and ensure each member of the team is on the same page. Learn how to formulate a residential design charrette, including setting the intention, building the agenda, and creating the attendee list. Also explore recent case studies of both effective and ineffective integrated design processes of high-performance building projects in California.

Suggested Presenter(s): Matt Christie, TRC Energy Services

### **Air Sealing Options: Choosing Wisely**

Spray foam insulation and air sealing products are finding their way into many building applications with its ease of job site customization and range of product offerings. However, the wide variety of products and chemistries can lead to a confusing array of too many choices when it comes to ensuring the product used has the right code approval, and is effective for the application. This presentation will compare different air sealing products, including new one component flexible gasket foam technology, in addition to various other spray foam, caulk and sill seal options. Air barrier control layer concept will be discussed for building envelope performance. Application specific comparisons will help builders and installers choose the right product for air sealing effectiveness, durability and ease of use.

Suggested Presenter(s): Linda Jeng, Dow Building and Construction

### **The Great HERS Rater Debate 2.0**

Building professionals, including HERS Raters, must address evolving homebuyer demands and increasingly stringent code compliance. This session brings together different perspectives from building professionals, including HERS Raters and a residential builder, in a moderated debate session to address the top issues facing this industry. Through engaging and interactive debate-style exchanges, we will explore pros and cons of different energy-focused construction techniques and solutions to meet today's marketplace needs. From cost-effective solutions that achieve code compliance to managing increasing homebuyer demands and addressing the growing trend of sustainable and efficient "healthy homes," The Great HERS Rater Debate will provide real, on-the-job insights and data to support their respective positions and approach on each of the issues. Incorporating real-time audience interaction,

the moderator will ask both prepared questions as well as those provided by the audience. At the conclusion of this presentation, attendees will gain insights from across geographies that can help shape energy strategies that work best for their climate zone and performance targets.

Suggested Presenter(s): Eric Werling, U.S. Department of Energy; James Monroe, James Monroe Homes & Robby Schwarz

### **Can you trust the data from a \$200 Indoor Air Quality (IAQ) monitor?**

Indoor quality monitors based on low-cost sensors are now available for under \$200. These devices report measurements of temperature, relative humidity and concentrations of one or more air pollutants. LBNL conducted experiments to determine how well these consumer-grade monitors detect and quantify concentrations of fine particles (PM2.5 and PM10) emitted from various common indoor sources. The output of low-cost monitors was compared to mass-based measurements using a Federal Equivalent Method and several research-grade light scattering monitors. This presentation will present results and discuss implications for using low-cost particle sensors to characterize and manage IAQ in homes.

Suggested Presenter(s): Brett Singer, Lawrence Berkeley National Lab & Iain Walker, Lawrence Berkeley National Lab

### **Emerging Technology in Deep Energy Retrofits for Multifamily Affordable Housing**

What are the latest strategies used to slash energy consumption by 50% and improve the performance of existing multifamily buildings? This session will present how a comprehensive building science approach was used to retrofit two different multifamily buildings for the local housing authority in Rockford IL. Detailed baseline performance testing was done to measure envelope leakage, duct distribution, zonal pressures, and flows. The retrofit design included continuous "outsulation" wrap on the building, water heating upgrades, and a first-of-its-kind approach to effectively sealing the entire building envelope using an aerosolized sealing system that simultaneously measures and seals building envelope leaks in homes. The design enabled the retrofit of small 15,000 btu modulating furnaces with VRF heat pumps for cooling. Modeling details, construction costs, and in-progress results from monitored and submetered post-occupancy performance will be presented in this research-driven project.

Suggested Presenter(s): Lindsey Elton, Eco Achievers; Paul Springer, AeroSeal; Brandon Weiss, Evolutionary Home Builders & Jason LaFleur (MODERATOR), Eco Achievers

### **High Performance Home Showcase**

High performance showcase home for the 2018 IBS in Orlando that will feature advanced roofing, appliance controls, thermal and electric storage, load management, and new panelized construction techniques. The home is being built near the Orlando convention

center at our Parkside community: <https://www.meritagehomes.com/search/orlando-fl/parkside/#.WV6jrfPn-00> The session would be in the morning followed by a learning and walking tour of the home with transportation provided by RESNET.

Suggested Presenter(s): CR Herro, Meritage Homes

### **Passive House in the U.S.**

I've heard discussion recently on the practicality of the Passive House standards within the U.S. Maybe a rep from Passive House would like to present on this.

Suggested Presenter(s): Mike Kernagis, Passive House Institute US

### **Automated house sealing - aerosol envelope sealing of new homes**

This session will discuss the overall objectives and interim results of a Building America project focused on integrating a new technology for automating the building sealing process in new homes. The process involves briefly pressurizing the building while applying an aerosol sealant "fog" to the building interior. As air escapes the building through leaks in the envelope, the sealant particles are carried to the leaks where they impact and stick, sealing the leaks. A standard blower door is used to facilitate the sealing process, and provide real-time feedback and a permanent record of the sealing. The technology is thus capable of simultaneously measuring, locating, and sealing leaks in a building remotely. Demonstrations of the technology have been very successful typically sealing 80% of the sealable leakage in under two hours of injection. The Building America project will provide significant research needed to successfully integrate aerosol envelope sealing into the home building process. The project team is working directly with builders to identify the best stages for incorporating aerosol sealing, from the perspectives of cost, performance, and seamless integration into the construction process. The cost of the aerosol sealing and resulting house tightness are compared to similar group of houses using conventional sealing methods. In addition to producing tighter houses, conventional sealing methods are evaluated to determine whether they can be eliminated or reduced to further improve cost effectiveness. This talk will present the results of the initial sealing demonstrations for builders in California and Minnesota.

Suggested Presenter(s): Dave Bohac, Center for Energy and Environment

### **The Basics of Unvented Crawlspace**

Says Mike Barcik of Southface, "I've been teaching building science and applications for 22 years but almost no topic is as fun to debate, discuss and debunk as that of a conditioned, unvented crawlspace". Come and learn the basics of how to properly design a conditioned crawlspace for a newly constructed home as well as how to make sure a retrofit is appropriate and done correctly. Understand the code references, common techniques employed as well as new technologies to help make this approach successful. Share your experiences and learn

from the experts like Skye Dunning of Building Performance Specialists about how to keep clients happy and grow your business with this important building strategy.

Suggested Presenter(s): Mike Barcik, Southface Energy Institute & Skye Dunning, Building Performance Specialists

### **Building Science Advisor - Solving the “Perfect Wall” for All**

Wall system design today is more challenging than ever. Performance expectations have changed. Materials and methods have changed. And cost competition is tougher than ever. Selecting a low-risk, moisture managed high performance wall system design today often involves consultation from expert building scientists. But, if high performance homes are going to be commonplace, we need a more scalable solution to get this expert knowledge into the hands of all industry professionals. Scientists from Oak Ridge National Laboratory and some of the world’s top experts on durable high performance wall system design are developing an online “expert system” tool that can help builders through moisture-managed high performance envelope design decisions. The tool will draw from Building America research projects, lab and field test measurements of high performance wall systems, computer aided risk analysis, and the expert judgment needed to make sense out of all the data. This session will update industry on the beta testing of this tool, which will be complete by December 2017, with the tool ready for prime time in 2018, and provide an opportunity for feedback.

Suggested Presenter(s): Eric Werling, DOE & Andre Dejarlais, Oak Ridge National Laboratory

### **A Changing Home Performance Market - Beating the Odds with Building Science**

Codes are changing. Materials are changing. Houses are getting tighter. Consumers are getting more educated, and more demanding. At Building America, our work is focused on researching and developing solutions to advance the market for high performance homes. Our solutions are designed to help builders succeed in the changing market - and to help home energy raters grow their businesses by staying ahead of technical trends. Our research projects result in tried-and-true technical and business solutions that can help weather changes and deliver high performance homes. In this session, we will discuss progress on Building America’s Research-to-Market Plan and associated Technology-to-Market Roadmaps, walk through all of the newly funded and cool projects being undertaken by the labs and our industry teams, walk through updates to ongoing projects, and highlight Building America resources that that can be used today.

Suggested Presenter(s): Eric Werling, DOE

### **Clearing the Air - National Baseline Indoor Air Quality Study and Methodology**

Healthy indoor environments are valued by homeowners and buyers but there is currently no way to effectively indicate or value the IAQ performance of a home. Lawrence Berkeley National Laboratory and Building America have been solving this problem by developing an IAQ scoring methodology and tool – an asset rating similar to existing ratings for energy use. New this year is a national baseline study of occupied homes built to current energy codes

(e.g., IECC 2012/2015), to better characterize the indoor air quality of new U.S. homes. This information will lead to improved guidance, future standards and code changes, and help prioritize future IAQ research. This session will present an update of progress on development of the IAQ score and information on the upcoming baseline studies. Comments and questions to help shape future development of the score are welcome.

Suggested Presenter(s): Eric Werling, DOE & Iain Walker, Lawrence Berkeley National Lab

### **Advanced Field Test & Measurement- Beyond the Basics of Rater Training**

Now that you've mastered blower door and duct testing, what's next? This hands-on session for novice raters will include demonstration of several common (and some not-so-common) airflow tests performed by advanced raters. In addition to the demonstration, attendees will learn the how's and why's of accounting for environmental factors such as temperature and air density.

Suggested Presenter(s): Bill Spohn, TruTec Tools & Rick Karg, Residential Energy Design

### **Measured Humidity Loads and Surface Water Activity in 12 Occupied Florida Homes**

Given the need for ventilation, can we really rely on industry-standard practices to achieve humidity control in thermally excellent houses in hot, humid climates? In theory, standard load calculation software accounts for both sensible and latent loads. But what are the actual humidity loads? And how about swing seasons when the AC equipment doesn't run for long periods? EPA's Indoor airPLUS Program helps address this concern by requiring additional dehumidification in homes built in hot, humid climates—although some builders feel this is an unnecessary expense. In this session, Lew Harriman will present findings from remote monitoring that measured real-time humidity loads in 12 occupied houses in Florida during the summer of 2016. Using tipping-bucket rain gauges, condensate was measured in 5-minute averages to more accurately understand occupied humidity loads (before ventilation to ASHRAE Std 62.2). In addition to humidity loads, the surface water activity of ceilings was measured over six months at the same intervals, to better understand the rise and fall of biologically available moisture that could support mold growth on indoor surfaces that have historically shown high risk of microbial growth.

Suggested Presenter(s): Lew Harriman, Mason-Grant Consulting

### **Valuing HVAC Installation in the HERS Index**

This session will provide an update from RESNET's HVAC Working Group who is currently working on protocols to value to the HERS index for proper HVAC installation.

Suggested Presenter(s): Dean Gamble, ENERGY STAR & Homes James Jackson, Emerson

## **Breaking Down RESNET/ANSI/ICC Standard 380 and the Status of Implementation into the MINHERS Standards**

This session will provide an update on the currently implementation of RESNET/ANSI/ICC Standard 380 into the RESNET MINHERS Standards. It will also review the protocol and standards changes in RESNET/ANSI/ICC Standard 380.

Suggested Presenter(s): Iain Walker, LBL & Gary Nelson, The Energy Conservatory

## **CAN SPRAY-ON SOLAR ESTABLISH ITSELF IN NEW AND EXISTING HOMES AND COMMERCIAL BUILDINGS?**

An interactive discussion with participants on spray-on solar and its potential use and affordability in both home and commercial buildings will encourage participants to look for new ideas in the Rating industry.

Suggested Presenter(s): RESNET Staff

## **Do Sealed and Insulated Attics Save Energy in New Homes?**

Residential attics have long been a contentious issue in building science and construction. Traditionally, attics have been insulated at the flat ceiling with deliberate venting between the attic and outside. This has aided in the thermal and moisture performance of attics. It is also common to place the HVAC system and ductwork in this attic space, especially in slab-on-grade homes. This exposes the entire HVAC system to the extreme temperature conditions of the attic, which in summer can widely exceed the outdoor conditions. This exacerbates the thermal and air leakage losses for the HVAC system. A solution that has been used for over 20-years is to seal and insulate the attic at the sloped roof surface, with no insulation on the ceiling. This makes the attic volume more like conditioned space, so that duct losses are minimized. However, this is offset by increased building envelope area and, sometimes, less insulation, leading to increase building loads. If the attic contains older, leaky duct systems, then the net savings could be significant. But what about a modern, insulated duct system, built to current code? Does a sealed and insulated attic add value to a system with R8 ducts and 5% leakage? What if there is also a cool roof finish or radiant barrier? Can we identify what makes this approach successful? When and where should it be used? How do we limit moisture risk? We will answer these questions through reviewing past literature, exploring data from current sealed attic monitoring studies, and through detailed simulations addressing these very questions in new California homes.

Suggested Presenter(s): Iain Walker, LBNL & Brennan Less, LBNL

## **Ventilation and Occupant Impacts on IAQ in New California Homes**

To decrease energy consumption, building envelopes are getting tighter, and to maintain good indoor air quality (IAQ), building codes (ASHRAE Standards 62.2) require the use of mechanical

ventilation and exhaust fans in kitchens and bathrooms. Do these systems really help to maintain good IAQ? Do people use ventilation equipment as intended? To investigate these questions, the Healthy, Efficient, New Gas Home project is studying ventilation and IAQ in California homes constructed since the 2008 building code came into effect. The collected data include characteristics of ventilation equipment, their performance, and their usage; occupant activities that impact IAQ; perceptions of IAQ and comfort (via a survey); and measurements of IAQ (formaldehyde, CO<sub>2</sub>, humidity, PM<sub>2.5</sub>, and NO<sub>2</sub>) over one week. This session will present the results of our field study; the summary of ventilation system performance (the airflow of exhaust fans was significantly higher than the minimum requirement in most of the homes), impacts of occupant activities on IAQ (effects of cooking and range hood use on PM<sub>2.5</sub> and NO<sub>2</sub> concentrations; relationship between estimated ventilation rates and indoor formaldehyde concentrations), and a summary of the occupant survey.

Suggested Presenter(s): Iain Walker

### **Beyond SEER: The Shifting Role of HVAC in Addressing Comfort through Efficiency**

The energy performance of heating and cooling systems, like many other components of the home, has steadily improved over time. But as these technology developments continue and the everyday needs of the HVAC system shifts, it is critical to ensure that overall occupant comfort is addressed as efficiently as possible. Many of the HVAC-related solutions available today to address these occupant needs (e.g. multi-stage compressors, variable speed blowers) are too complex to be adequately simulated by RESNET accredited home energy rating software. This session will cover how advanced HVAC systems and controls can address more than just sensible heating and cooling loads, and the impact this shift can have on how we evaluate and market energy performance through the HERS Index, especially for residential new construction. This session will include results from field studies conducted by Trane to measure humidity response and control in the Southeastern US, modeling and analysis work by Salcido Solutions detailing the energy performance of variable speed equipment, and discussion by a dealer (to be determined at a later date) on the application of these advanced systems in the field.

Suggested Presenter(s): Jeff Tyminski, Ingersoll Rand & Rob Salcido, Salcido Solutions

### **New Venting Technology Expands the Retrofit Applicability of Residential Condensing Furnaces: Results and Findings from a Recent Field Test**

A new venting technology developed by a leading US venting manufacturer allows condensing furnaces to be installed in existing houses where venting issues previously prevented their installation. As a result, the energy savings potential and other benefits of condensing furnaces can be realized in more homes. In an existing home with a natural-draft water heater, a condensing furnace cannot always be installed to replace an existing, non-condensing furnace.

The new condensing furnace is usually side-wall vented because the condensing furnace and orphaned natural-draft water heater cannot be commonly-vented through the same existing chimney. However, in some homes (e.g., row houses, condominiums, townhouse), side-wall venting is not possible and/or economical because of building and gas codes, the location of the furnace within the home relative to its exterior walls, the high cost associated with creating and concealing a new vertical chase within the living space of a home, aesthetics, and other issues. The new venting technology allows a condensing furnace and a natural-draft water heater to be commonly-vented in the same vertical space utilizing the existing Type B vent pipe. This session will present the results of a field test conducted to measure and verify the performance of the new venting system installed in 16 homes located in four cities within the US. The design and installation process of the new venting system will be described in detail. Information learned from the field test regarding installation time and costs, implementation procedures, and design improvements will be discussed. The results of diagnostic measurements and continuous data monitoring performed on the houses that demonstrate the successful operation of the new venting system will be presented.

Suggested Presenter(s): Mark Ternes, Oak Ridge National Laboratory

### **High Performance Homes that Remain Safe**

There is much emphasis on building homes that are energy efficient, comfortable, durable and healthy while “Doing No Harm”. This presentation explores how we can verify if a home is providing a healthy environment after it is built and years down the road. We know occupant behavior plays a role, however, do the installed systems, materials and lack of occupant education play an even bigger role on comfort, indoor air quality and safety. We will explore the many benefits of a healthy home, verification techniques and solutions.

Suggested Presenter(s): Les Lazareck, Home Energy Connection, LLC

### **Making the Most of Advanced Framing**

Most energy professionals understand the basic concept of advanced framing, moving from 2x4 studs at 16 inches on center to 2x6 studs at 24 inches on center. What about floor joist spacing, or header options? Increased floor joist spacing can result in reduced cost in materials and labor, while providing more room to properly insulate rim and band areas. This course will explore beyond the basics, and include the advantages of changing floor joist spacing and options for headers that can provide additional energy savings. The many advanced framing techniques provide numerous options to both reduce cost and conserve energy.

- Learning Outcome 1:  
Understand advanced framing basics and how to work through challenges often faced when discussing with builders.

- Learning Outcome 2:  
Understand the energy efficiency gains that can be attained by utilizing advanced framing, and how raters can take credit for it in the building energy model.
- Learning Outcome 3  
Learn the advantages of 24 inch on center floor joist spacing and how to address questions on stiffness, floor noise and energy savings.
- Learning Outcome 4  
Understand options for headers that allow more insulation and fewer framing members, while maintaining structural integrity.

Suggested Presenter(s): Matthew Brown, APA-The Engineered Wood Association

### **Myths and Mistakes in Energy Efficient Homes**

Modern energy codes have created great opportunities for today's Home Energy Raters as well as a new set of challenges. Energy code requirements sometimes have unintended consequences on the construction of the house and it is important to understand how all of the parts work together to create strong, energy efficient, and durable homes. This session will help to identify the four paths in the 2015 energy code as well as the common misunderstandings about energy efficient homes. Just as the structural design of homes must take into account energy conservation requirements, energy raters must understand how homes withstand gravity and lateral loads. The session will also review moisture management strategies in walls, and discuss methods for durable, structurally strong, and energy efficient assemblies.

Learning Outcome 1:

Understand the different methods for compliance with the 2015 IECC, including the opportunities and obstacles of each path.

Learning Outcome 2:

Recognize common challenges in the prescriptive path and methods that can be used to overcome them.

Learning Outcome 3

Learn the importance moisture management in today's high performance wall systems and how to avoid common pitfalls and dispel common myths about moisture management.

Learning Outcome 4

Recognize changes to the way air sealing requirements are changing home construction, gain insight on managing the process and understand the effect that air sealing has on the building envelope.

Suggested Presenter(s): Matthew Brown, APA-The Engineered Wood Association

### **Got Air Infiltration Problems? Let's "Make it Better" (Tom Petty, 1985)**

One of the most prevalent issues we find when rating tract-built homes in jurisdictions enforcing 2012/2015 IECC is that they fail the air infiltration goal of 3.0 ACH50. This causes the builders to go back and attempt to air seal the house after drywall is complete which can be a difficult task. This retroactive process often fails which can cost the builder thousands of dollars in code compliance, settlement delays and often an ENERGY STAR® certification. The proposed presentation outlines a process of air-sealing to decrease air infiltration and likely save the builder in costs and delays. This is accomplished by air sealing the shell of the home from the outside utilizing a commercially available liquid applied air/moisture barrier. This process will:

- Eliminate the need for house wrap
- Eliminate the need for using spray foam insulation on the exterior walls
- Reduce the need for air sealing framing
- Improve the efficiency/extend the life expectancy of any HVAC equipment or ducts in the attic
- Allow early use of a blower door to locate/repair any leaks
- Eliminate the need for measuring duct leakage to the outside since all ducts will be inside the thermal envelope of the house

Suggested Presenter(s): Tim Faff, ICF & Stephen Willingmyre, ICF

### **Design, Build, Perform: HVAC Systems for High Performance Homes**

Houses are getting tighter and better insulated, which results in lower cooling and heating loads and the need for smaller, more efficient mechanical systems. Traditional HVAC systems are often oversized, which causes “short cycling” resulting in comfort and indoor air quality issues. This session will address the proper way to design and install a "right sized" cooling and heating system for a high performance, low load home.

Suggested Presenter(s): Rob Howard, Mitsubishi Electric Cooling & Heating

### **Advanced Whole House Fans, reshaping the concepts of cooling**

Presentation will provide an overview of QuietCool systems, the advanced whole house fans which are donating the CA high performance homes. With the reinvention of traditional whole house fans, the modern day quiet systems are able to operate at decibel levels equivalent to HVC systems, yet consume wattages at the levels of a few light bulbs.

"A special feature of the 2017 RESNET Building Performance Conference is the session “Cultivating a New Generation of Leadership in the HERS Industry”. This session will be a forum led by and aimed at the next generation of leaders. Why a RESNET Emerging Leadership Council?

Discussion of possible activities of council

Interactive and fun polling of participants throughout session

How you can get involved remain sustainable the HERS Industry needs to cultivate leadership

from the new generation. X generation and Millennials communicate in different form than Baby Boomers who gave birth for the industry. In order to remain relevant the industry must recruit, mentor and nurture the next generation of leaders.

To meet this need RESNET has formed the RESNET Emerging Leadership Council.

A special feature of the 2017 RESNET Building Performance Conference is the session “Cultivating a New Generation of Leadership in the HERS Industry”. This session will be a forum led by and aimed at the next generation of leaders.

Topics of discussion will include:

- Why a RESNET Emerging Leadership Council?
- Discussion of possible activities of council
- Interactive and fun polling of participants throughout session
- How you can get involved

Suggested Presenter(s): Andy Llorca, QC Manufacturing, Inc.

### **How is comfort of a home related to the design and HERS number?**

Today the challenge is not that much on how one implements energy efficiency goals but on satisfying concurrently the durability and comfort performances that homeowners expect. Durability should be the first design driver, followed by comfort but satisfying high performance at the same time. Achieving low HERS numbers on residential buildings is becoming mainstay especially with the IECC 2015 requirements. However even if you satisfy the energy requirements using either the RESNET/IECC standards for each US climate zone; how comfortable are these homes? Until recently computer models that include the multi-disciplinary approach that account for the occupant response to the imposed environment for each room of a residential building was not possible, recently this has changed. Using advance whole building simulation tools with ASHRAE Standard 55 allows one to design for comfort, ANSI/ASHRAE Standard 55-2013 defines the range of indoor thermal environmental conditions acceptable to a majority of occupants, but accommodates an ever increasing variety of design solutions intended both to provide comfort and to respect today's imperative for sustainable buildings. In this presentation, the impact of advancing codes (IECC 2006, 2015, PHIUS2017) on the positive thermal comfort will be analyzed for one residential home in all 8 IECC Climate Zones. Results will show how one can get significant benefits in comfort by designing homes that exceed the IECC 2015 requirements, where the justification of higher R-value envelopes can substantially improve the comfort of a home.

Suggested Presenter(s): Achilles Karagiozis, Owens Corning

### **Diagnosing CAZ Test Failures**

You have set up a house for worst-case depressurization and started the water heater up and you find combustion spillage. Now what. Is the cause a blocked or deteriorated chimney, undersized venting, too many vent elbows, too much depressurization caused by fans or the

air handler or closing doors. Is it a combination of two or more of these? Should you replace the water heater? Gathering good data is critical. We will demonstrate a pressure graphing software and an easy to use spreadsheet used to calculate CFM flow from house depressurization numbers. Come learn from an instructor that worked in the Minneapolis Sound Insulation Program, which became the basis for the BPI Combustion Safety Procedures, as he takes you through a step by step process to help diagnose the issues and present many practical solutions. You have set up a house for worst-case depressurization and started the water heater up and you find combustion spillage. Now what. Is the cause a blocked or deteriorated chimney, undersized venting, too many vent elbows, too much depressurization caused by fans or the air handler or closing doors. Is it a combination of two or more of these? Should you replace the water heater? Gathering good data is critical. We will demonstrate a pressure graphing software and an easy to use spreadsheet used to calculate CFM flow from house depressurization numbers. Come learn from an instructor that worked in the Minneapolis Sound Insulation Program, which became the basis for current combustion safety procedures, as he takes you through a step by step process to help diagnose the issues and present many practical solutions.

Suggested Presenter(s): Paul Morin, The Energy Conservatory

## **Energy Policy & Programs**

### **Raters' Perspectives on New Homes Programs: Designs that Drive Participation—NATIONAL EDITION**

As a designer and implementer of residential new construction programs, manager of a HERS providership, and president of the Northeast Home Energy Rating System Alliance, the authors interact with HERS raters working in a variety of residential new construction programs across many states. Comments shared by dozens of raters made it clear that some programs presented a high “barrier to participation”, through difficult qualification criteria, challenging submission requirements, or hard to track down program staff, while participation in other programs was relatively easy. However, the viewpoints shared by raters were purely anecdotal. Despite the informality, it was clear that there was valuable feedback for program designers and administrators in the perspectives of these key trade allies.

Therefore, the authors designed a survey to be administered to raters across the nation, as a follow-up to the NEHERS-focused survey conducted in 2016. Survey questions included topics such as: how important are utility programs to the raters' business; how many different programs do they participate in; how do programs support raters via marketing, technical assistance, and quality assurance; which forms of support are most valuable to the raters; what do programs require for submissions beyond a standard HERS rating; what factors if any limit your participation in utility programs. The survey also addresses variables such as the size of the raters' business, and the level of incentives made available through programs they participate in.

Suggested Presenter(s): Kathleen Greely

### **Stranger Things - the Energy Code Myths that Haunt Us**

Seemingly simple things like the calculating the R-value of a hybrid insulation system and utilizing air space to contribute to your envelope compliance are often done incorrectly. Unfortunately, they can result in big energy penalties. We will take on these examples, and help you educate your customers.

Suggested Presenter(s): Amy Schmidt, Dow Building and Construction; Jay Crandell, ARES Consulting

### **Net Zero Shenanigans**

How do we measure Zero? Is it zero energy or zero energy and water? Are we looking at source or site energy? Should we include Time Dependent Valuation? This session will discuss

what's been done before and what's happening now in the Net Zero community and propose what road maps for success might look like in order to achieve certifications, deliver the best bang for the buck for homeowners, or to potentially qualify for utility incentives. Learning Objectives include: -Framing the correct conversation for the correct audience on what zero means - Understanding where key certifications differ in requirements -Predict the best bang for the buck for homes attempting to achieve zero -Find access to data and resources to help your next project achieve zero

Suggested Presenter(s): Dan Wildenhaus, CLEARResult & James Domanski, CLEARResult

### **Hidden in Plain Sight: Understanding Air Leakage and Innovative Technologies**

The effect of air leakage in buildings is misunderstood. Energy savings are not modeled correctly and are not the main reason to have an air barrier in a building. Building operation in various climates need to be understood and the performance of the material needs to meet the building needs. This presentation identifies some of the issues that need to be considered as you evaluate the performance of a building and the performance of the air and water control layers.

Suggested Presenter(s): Laverne Dalglish, Air Barrier Association of America

### **Building Value in a Circular Economy**

The Circular Economy is an idea whose time has come, and it has the power to transform the building industry. Already gripping Europe and China the Circular Economy is based on an industrial ecology – meaning that the industrial use of materials will mimic the natural use of materials – where nothing is wasted and everything has value. For buildings, that means no more piles of rubble at their end of life. Circular Economy Buildings will be designed to be redesigned so that they can adapt to the changing needs of the building's users and community. They will improve over time instead of degrading into obsolescence. Their value will be determined by their performance, not their price tag; so that energy and environmental goals will be overachieved - not overpromised.

Circular Economy Buildings use resource scarcity to create economic abundance. The endless circular flow of products and materials keeps buildings at their highest value for businesses and users. There are an abundance of business opportunities in this new economy for building professionals. This session will provide participants with the understanding and tools to succeed in a building industry based on the Circular Economy.

Suggested Presenter(s): James Ball, MaGrann Associates

### **The Dog that Caught the Car: A Case Study in the Unexpected Hazards of Achieving ZNE**

Zero Net Energy (ZNE) is the apex of energy efficiency in buildings. Once thought of as the distant and lofty goal of only the most avid purists, nudges from state policies, improved design methods, and efficiency certification programs have demonstrated that ZNE is both technically and financially viable for the mainstream. This has also brought into light a new

slough of systemic challenges with grid reliability and utility business models. State energy offices and utility programs, particularly in California, that at one point were the primary champions of true ZNE are suddenly like the dog who caught the car; coping with unintended consequences and trying to strike a new balance between efficiency, distributed generation, and meeting their greenhouse gas reduction goals. Learn about the practical policy challenges that came along with the aggressive approach towards California's 2020 residential ZNE goal.

Suggested Presenter(s): Matt Christie, TRC Energy Services

### **Leveraging Raters in Energy Code Development and Adoption of ERI**

The Energy Rating Index Compliance Path is now in the 2015 and 2018 editions of the International Energy Conservation Code. The popularity of the ERI continues to rise as it gets adopted in more states. With over 200,000 homes being rated each year, HERS Raters have the on-the-ground knowledge of construction practices and techniques that get debated during each development and adoption cycle. Come to this session to learn about the IECC development process that will happen in 2019 and hear about how you can get involved with the development and adoption of energy codes in your state. This session will also cover the major changes from the 2015 to the 2018 ERI path.

Suggested Presenter(s): Eric Makela, Cadmus Group & Robby Schwarz, Energy Logic

### **The Vision for the ERI: Is a Cost-based Rating Index viable?**

During 2015, the Calculation Subcommittee of RESNET's Standard Development Committee (SDC) 300 explored alternatives to the normalized Modified End Use Load (nMEUL) calculation method. Out of this effort, characteristics of a variety of metrics were derived including that of a cost-based calculation method. Combined with the need for harmonization between RESNET and California as well as the declared interest of stakeholder groups, the conclusion was drawn that a deeper examination of a cost-based approach is appropriate. In response, the SDC 300 Chairman, Brett Dillon, issued a New Work Item (NWI) that established a Cost-Based Energy (performance) Rating Index Task Group (CBRITG). The purpose of the CBRITG was to investigate the potential for development of a cost-based rating index and to develop a concept and work plan for a cost-based energy rating index calculation method. The scope of the CBRITG was to develop a concept of a cost-based energy rating index calculation method as a proposed alternative to the normalized Modified End Use Load energy rating calculation method in ANSI/RESNET/ICC Standard 301-2014 along with a work plan for further development by SDC 300. In this session, the audience will have the opportunity to hear from Members of the CBRITG on their key findings, conclusions and recommendations through a review of the Feasibility Report submitted to the SDC 300.

Suggested Presenter(s): Jerry Phelan, Covestro LLC; Vrushali Mendon, Pacific Northwest National Laboratory & Philip Fairey, Florida Solar Energy Center

### **RESNET/New Buildings Institute Partnership on Certification of Net Zero Energy Homes**

The New Buildings Institute (NBI) is adopting a certification program for net zero energy buildings. The certification will involve both an asset rating and a performance rating. RESNET is working with NBI in having the HERS Index as part of the certification process for residential buildings. This session will explain the NBI's Net Zero Energy Building Certification Program and explore the business opportunities this program has for HERS Raters and Energy Smart Builders.

Suggested Presenter(s): David Goldstein, NRDC & Jim Edelson, New Buildings Institute

### **Consortium for Energy Efficiency HERS Index Initiative**

The Consortium for Energy Efficiency (CEE) is the bi-national organization of energy efficiency program administrators responsible for ratepayer-funded efficiency programs in 46 US states, the District of Columbia, and seven Canadian provinces.) is the bi-national organization of energy efficiency program administrators responsible for ratepayer-funded efficiency programs in 46 US states, the District of Columbia, and seven Canadian provinces. CEE has developed a draft new construction initiative. The foundation for the CEE residential new construction specification is the RESNET HERS Index Score.

This initiative can have a significant potential for the HERS industry. In 2015, CEE members directed nearly \$7 billion of the \$8.7 billion in energy efficiency and demand response program expenditures in the two countries. CEE has developed a draft new construction initiative. The foundation for the CEE residential new construction specification is the RESNET HERS Index Score.

This initiative can have a significant potential for the HERS industry. In 2015, CEE members directed nearly \$7 billion of the \$8.7 billion in energy efficiency and demand response program expenditures in the two countries.

This session will explain the new program and explore its implications for HERS Raters and builders.

Suggested Presenter(s): Alice Rosenberg, Consortium for Energy Efficiency & David Goldstein, NRDC

### **Making an impact with energy code training (and measuring it!)**

Performance Systems Development recently completed a three-year effort to measure and improve energy code compliance in Pennsylvania. This project, a part of the Department of Energy's multi-state Residential Energy Code Field Study, involved three phases: a baseline compliance measurement, a training, education, and outreach program, and a post-program compliance measurement. With data from 171 job sites, the baseline compliance phase found that Pennsylvanians could save \$150 million over ten years through full compliance with duct leakage, above-grade wall insulation, and lighting requirements. Next, PSD launched the Penn

Energy Codes Program, which focused on the key problem areas through training programs, seminars, in-office and on-site technical assistance, information drop-offs, Rater energy code consultations, a checklist/educational app, and a variety of marketing tactics including direct mailings and e-newsletters. Finally, PSD performed the post-program compliance measurement to see if the program had an impact across the broad geographic coverage area. Attend this session to learn about the process and find out the results. This session could be combined with presentations about one or more other states involved in the study, with presenters from the Midwest Energy Efficiency Alliance (MEEA), Newport Ventures, SWEET, SPEER, the Institute for Market Transformation...

Suggested Presenter(s): Mike Turns, Performance Systems Development

### **Multifamily Housing: Perspectives from a multi-year study evaluating rated vs. measured energy performance and construction costs**

This presentation shares findings from a multi-year study that measured the energy performance of green multifamily housing stock in Virginia. Over the last ten years, the Virginia Housing Development Authority (VHDA) has utilized green building rating system incentives as a policy vehicle in the Low-Income Housing Tax Credit (LIHTC) program to encourage energy efficiency (EE) in the affordable rental stock in Virginia. This policy effort has led to 18,500 rated multifamily units since 2007. The study addresses key issues related to EE and affordable housing through the measurement of actual, unit-level energy use in 237 apartments across 15 developments. The effects of year to year operation, weather, and behavior on energy use were evaluated. Data, analysis, and findings focus specifically on facilities constructed and certified to the EarthCraft Multifamily rating system in Virginia. Additionally, construction cost data was analyzed for 23 developments containing 236 apartments to compare the cost for building green versus non-green. Research methodology will also be discussed.

Suggested Presenter(s): Matt Waring, Viridiant; Sean Evensen-Shanley, Viridiant

### **Market Transformation - Teamwork, Tenacity, and Time**

How do you overcome outdated building codes, price-driven homebuilders, non-existent incentive programs, and uninformed consumers? Changing the status quo in any industry is a challenge, ... especially in a market that resists progress. Champions have to be created, stakeholders must be enlisted, and resources need to be leveraged. Teamwork, tenacity and time have produced ENERGY SMART builders, an increase of HERS Ratings, a conversion of Realtors, and the creation of utility incentives. Learn effective ways to transform your local homebuilding market from guys who are actively doing it in theirs!

Suggested Presenter(s): Todd Gamboa, Building Trust LLC & Robby Schwarz, EnergyLogic

## **Innovating for Inclusion: Expanding Your Footprint to Americans with Disabilities**

In a nation where 1 in 5 people have a disability, utility companies are tasked with finding new ways to effectively bring energy-saving services to a broader range of customers. DTE Energy took their mantra, "Know Your Own Power"- further this year by focusing on a customer segment that needed more: the Deaf and Hard of Hearing community. Guided by the principle that programs require continuous evaluation from a customer-centric lens, DTE launched a pilot to test how they could meet the needs of this community and others like it. Meet with DTE Energy as they discuss their dynamic partnership with the Alliance for Deaf Services and demonstrate the implementation of Talk-to-Text and Video Remote Interpretation technology. Uncover how it opened the door to serving the deaf and hard of hearing community and explore what it takes for your organization to provide complete service to every customer. This interactive roundtable gives you a look at their journey from program design and staff education to in-market implementation.

Suggested Presenter(s): David DeLind, DTE Energy; Todd Morrison, Alliance for Deaf Services & Mylan Stevens, Franklin Energy Group

## **RESNET and Utility Efficiency Programs - Enhancing Collaboration**

Utility incentives support the design and construction of high efficiency buildings. Such programs can be notoriously complicated to take part in due to a complex regulatory environment operating in the background that counts, confirms and verifies energy savings claims via a rigorous process. Often programs force extraneous energy modeling or verification requirements that go beyond the standard HERS tools, or only allow a single specific HERS tool in their program rules. The RESNET Utilities and HERS Software Programs advisory working group has been actively working to break through this barrier and accelerate the use of RESNET software tools in utility programs. Come learn about and contribute to the advisory group's mission, progress, and ideas such as standardized output reports, utility-grade energy use and savings calculations, simplified custom reference home inclusion, and improved modeling guides and protocols. Members of the RESNET Utilities and HERS Software Programs advisory working group will present, discuss, and answer questions.

Suggested Presenter(s): Cy Kilbourn, Ekotrope; Alice Rosenburg, Consortium for Energy Efficiency; Nate Kleist, Energy Diagnostics & Matthew Christie, TRC Solutions

## **nMEUL Is the Worst of All Options Except for All the Rest: To Change or Not to Change - Opinions Vary Widely**

Normalized Modified End Use Loads (nMEUL) is the calculation methodology underlying RESNET's Energy Rating Index (ERI). It has served RESNET well since its inception many years ago, but recent changes in application of ERI in codes and code-intended standards by ICC and

ASHRAE have resulted in higher visibility and expressions of concern by different stakeholders who are not familiar with the nMEUL methodology. This panel discussion and audience participation session will provide attendees with various viewpoints about the current RESNET calculation methodologies as well as options for supplementing or changing the methodologies, especially nMEUL. Use cases and stakeholder impacts will be explored as well as future options that may or may not be better overall than the current nMEUL methodology. Presentations will be followed by interactive discussions among panel members and with attendees during this 90-minute session.

Suggested Presenter(s): David Goldstein, National Resources Defense Council; Martha Brook, California Energy Commission & Craig Drumheller, National Association of Home Builders

### **Residential Energy Guarantee - Don't Just Say Its Energy Efficient - Guarantee It!**

As a Builder you build Energy Efficient new homes – and rate them with a HERS Index. As a HERS Rater you rate Energy Efficient new homes for builders – using the HERS Index.

How do you set yourself apart from the crowd?

As a Builder – you don't just say your homes are Energy Efficient – you guarantee it!

As a HERS Rater – you don't just rate homes with a HERS Index like other raters – you guarantee it!

Bonded Builders Warranty Group (now Centricity!) pioneered taking the HERS rating and Energy Efficient construction to a whole new level with the Residential Energy Guarantee. Finally, (1) a way for builders to demonstrate to your buyers the confidence you have in your new homes energy efficiency, and (2) a way for raters to demonstrate to your builder customers the confidence you have in your ratings.

This session will introduce you to this revolutionary way to differentiate yourself as a builder or a rater and market your Energy Efficient efforts for more ratings and more home sales.

Suggested Presenter(s): Roger Lange, Bonded Builders Warranty Group

### **Domestic Hot Water Distribution Challenges in Multi-Family Construction**

Supporting multifamily projects in the DOE Zero Energy Ready Homes and EPA WaterSense Programs was challenging prior to revisions to the hot water distribution requirements for central distribution systems. This presentation will use case studies to demonstrate the hot water pipe lineal feet and testing 10°F ΔT requirements. We will review demand circulation technology for central distribution systems, which seem to work fairly well for hot water distribution (referencing Building America's "Control Strategies to Reduce Energy Consumption of Central Domestic Hot Water" report found roughly 10% DHW fuel savings). And review the energy benefits associated with a high efficiency central plant versus numerous in-unit small tanks. One such solution is to solve efficient distribution with demand recirculation control based on both flow and temperature. While this strategy has merit there are concerns with the functionality of mixing valves with non-continuous operation due to a concern for bacterial

risk in HW piping which doesn't have continuous flow but still sees frequent water exchange. Based upon early discussions it's clear that more information needs to be shared amongst professionals. It is the presenter's intent to share challenges and solutions, modeling tools, and examples of verified and measured water and energy savings.

Suggested Presenter(s): Karla Butterfield, Steven Winter Associates, Inc. & James Lyons, P.E., Newport Partners

### **Set the Bar, and They Will Limbo**

In 1997 Vermont's very first Energy Code had an Energy Rating code compliance path. Now more than 30% of new homes annually use an Energy Rating to show code compliance. In that interval, Efficiency Vermont, the state's energy efficiency utility and only Energy Rating provider, has leveraged the widespread use of Energy Ratings to increase the code compliance rate and to develop a voluntary High Performance Home standard that has claimed triple digit growth in the new construction market every year since its introduction. In this session we will discuss how Energy Ratings have supported the continually increasing performance of Vermont's housing stock: from a baseline far exceeding code requirements; to creating a real estate market for energy efficient homes; to spurring a zero energy home industry. The trifecta of home energy efficiency: buyer expectations, builder expertise and market incentive has come together in Vermont, and it all started with Energy Ratings.

Suggested Presenter(s): Li Ling Young, Vermont Energy Investment Corporation & Sara DeVico, Vermont Energy Investment Corporation

### **Duck Hunter! Understanding how distributed energy resources fit into the New Construction landscape**

As an industry, we have traditionally focused on energy efficiency, water efficiency, efficient use of products, indoor air quality and safety, and development sustainability - as these issues tend to relate to both better buildings and happier homeowners. Due to a variety of source energy and site usage trends however, the needs to help shift loads and flatten load curves has become a real and pressing issue for many utilities and municipalities: enter the Duck Curve. This session will look at how these trends may impact program designs, incentives, and product offerings where the benefits are primarily for the utility instead of the homeowners. How can we tap into this as an industry? How can we pass along or sell these benefits to homeowners? What products and processes provide both demand response and energy efficiency benefits? Dan and David will host a lively discussion and take a look at the big picture first, then zeroing in on real opportunities.

Suggested Presenter(s): Dan Wildenhaus, CLEAResult & David Treleven, Advanced Energy

## Enhanced HERS Index Consistency/Quality Assurance

### **Calibration & Field Checks - What and When!**

This session will explain the manufacturer calibration process, requirements and how it relates accurate measurements. We will cover different procedures by each manufacturer to make sure you understand what must be completed and when and good QA procedures. Ever wonder what the manufacturer does before you receive your equipment or when you send it back to be calibrated? We'll take you behind the scenes to see the process. This session will explain the difference between gauge calibration (pressure) and fan calibration (flow). Do you know which will cause a greater error - a gauge off by 10% or a fan off by 10%? Find out the reality of accuracy and repeatability in this session.

Session Objectives:

- The difference between the manufacturer calibration and a field check.
- What is required by the manufacturer to be calibrated and when
- Live demonstration on how to perform a field check on a gauge, when it should be performed and how to document results.
- Live demonstration on how to check a fan, blower door and duct testers, to make sure they "in calibration"
- Better understanding of what the manufacturer measures at the factory to confirms that your device is accurate.

Suggested Presenter(s): Joe Medosch, Energy & Environmental Consulting LLC & Frank Spevak, The Energy Conservatory

### **The Future of HERS Ratings. How technology can overcome human errors in construction.**

Futurology- the ability to imagine, anticipate and integrate future technologies. See how technology can overcome human errors in construction. This all comes together in a live performance simulating an "evaluation" (aka audit). As I walk through a 3D house, you the audience will see the views from my "surround cameras", "wrist PC", Augmented Reality and other micro devices that evaluate the conditions in the house, (all simulated). Includes narration that explains the conditions, devices and what current technology this is based on. The year is 2025, all homes (new and existing) live and die by their HERI (Health & Energy Rating Index). No one would purchase a home without knowing the HERI, as common as solar panels. Come experience the future!

This not a traditional presentation but a live simulated "evaluation" of a Home. All technologies are based on current and predicted technologies that will be implemented sooner than we imagine. I will mix together a collection of techno-advances, nanotechnology and social big-data. See how the structure, mechanical systems, energy consumption, IAQ, heat transfer, moisture and air movement can be visualized during this walkthrough. I will

guide you through a house built in 2018 that is being evaluated in 2025. You will experience technologies that are now common construction in a “smart home”. Many construction techniques are the same, but some have evolved and integrated into common items. FYI- Home’s now have a proper name, such as “Brad.” It’s easier to talk to your Home if it has a name!

This “evaluation” will include the super duper high tech devices that are already being introduced in the market today. You’ll see how they’re incorporated into the tools we will use and even alert you to conditions that are not visible. Big Data becomes simplified and provides a history of each Home based on the shared social experiences from the occupants.

Remember that leak in the bathroom you posted - now that leak is associated with that address, forever. Healthy home becomes synonymous with a Zero+ Home, (homes that produce energy and dividends) Duh - its 2025! Did I mention your community now has a Health Index based on the number of reported hospital visits for conditions like Asthma? The HERI incorporates healthy building conditions and hazardous materials. The “evaluation” includes real time VOC’s and other conditions that compliment or conflict with the occupant’s genome.

Join me in the future!

Suggested Presenter(s): Joe Medosch, Energy & Environmental Consulting llc

### **Harmonizing HERS and Home Energy Score**

Many states and other jurisdictions are interested in promoting both HERS for residential new construction programs and DOE’s Home Energy Score for existing homes initiatives. The differences in the underlying modeling engines of these two rating systems, as well as their outputs (e.g. scales, scores, energy and cost estimates), pose challenges for generating consistent energy information at point of sale and could lead to consumer confusion. Over the past year, a diverse group of states, programs and others have been making great progress on an initiative to “harmonize” HERS and Homes Energy Scores under the moniker of “EMPRESS” (Energy Metrics to Promote Residential Energy Scorecards in States). This session will present recommendations from EMPRESS for consistency with rating metrics and labels across HERS and Home Energy Score, along with an update and recommendations for moving toward a common modeling engine. Included in the presentation will be the results of some NREL analyses that compared HERS, Home Energy Score and ResStock. In addition, we will present the EMPRESS Policy Toolkit developed to help states and jurisdictions develop and promote model policies, legislation, regulations and governance frameworks to promote home energy ratings and scorecards.

Suggested Presenter(s): Richard Faesy, Energy Futures Group; Joan Glickman, DOE Home Energy Score; Noel Merket, National Renewable Energy Lab (NREL) & Leslie Badger, Vermont Energy Investment Corp.

### **Getting Analytical - Data driven approaches to drive quality work**

RESNET has made the leap to a data driven approach to quality assurance with the implementation of a comprehensive analytic tool for the entire industry. If you're still relying on random selection for your quality assurance and/or quality control it's time to think deeper. This session will explore issues around what to look for, why to look there and how to do the looking. There will be a short section on the difference between quality control and quality assurance to set the stage for the rest of the discussion. You should come away with these key learning objectives: 1) An understanding of the difference between quality control and quality assurance 2) An understanding of the implication of random selection for quality control 3) A place to start using analytics to enhance your efforts 4) How consistent analytic QA keeps your staff between the guardrails 4) Common QA mistakes that you can and should catch

Suggested Presenter(s): Steve Byers, EnergyLogic & Glenn Pease, EnergyLogic

### **Remote/Virtual QA: Making a Better Industry**

As HERS ratings grow in popularity, the QA requirement stays the same; 1/10 and 1/100. Meaning every year, more and more file and field QA's are required by our standards. Due to the nature of our industry, QAD's cannot always be on site for a 1/100 field QA during the golden hour (which is shortly after a final inspection is completed by the rater, but still unoccupied). The schedules of builders, trades, and homebuyers are highly variable and it is not uncommon for your provider and/or QAD to be accessible only by flight or phone. Remote/Virtual QA can be done by having the rater (or QA Delegate) retest a house while on a video conference call. This can be done immediately after they have registered the rating and still allow the provider to do blind QA. EnergyLogic has piloted a Virtual QA process with RESNET and has used Virtual QA to go above and beyond the RESNET Standards to strengthen our QA process. This session will cover the concept and implementation of Virtual QA, and ultimately pitch how adoption of this method strengthens our industry.

Suggested Presenter(s): Glenn Pease, EnergyLogic & Ben Graham, EnergyLogic

### **What is the cost of poor quality?**

Surely you have asked yourself one of the following questions:

- 1) What does an extra trip to the jobsite cost?
- 2) How much time and money is wasted on tasks that provide no value?
- 3) How much does a failed inspection cost a program?
- 4) What are the true impacts – financial or otherwise – of a customer complaint?

During this session, we will come to agreement on a definition of quality and explore the effects of defects and waste in the context of profitability, program cost-effectiveness and customer loyalty. Working together in small groups, participants will explore the potential consequences of common defects and inefficiencies experienced on a daily basis. Leave this session with tools that allow you to calculate the cost of poor quality and document the benefits to an organization focused on the task of identifying and fixing problems.

Suggested Presenter(s): Shaun Hassel, Advanced Energy

### **Leveraging Software Technology for a More Efficient, and Profitable, Rating Business**

With RESNET's increasing quality assurance requirements, the data collection and tracking burden on Raters and Rating Providers is mounting. Those who do not leverage technology as an integral part of their business, especially when their objective is growth and profitability, are going to be left behind. Learn how one RESNET Provider is successfully leveraging a cloud based rating management tool to streamline the QA process and keep costs in check for their business, allowing them to remain cost competitive in the HERS ratings marketplace. This session will provide an overview of features in software technology that are directed at increasing the quality and efficiency of ratings while at the same time meeting the more rigorous requirements of RESNET QA.

Suggested Presenter(s): Michael Resech, Residential Science Resources; Daran Wastchak, DRW & Erik Sowers, Residential Science Resources

### **Field verification and modeling of mechanical ventilation systems**

It was once a rarity for a home to include a whole-house mechanical ventilation system. With the rise of advanced energy codes, ENERGY STAR Version 3, and more stringent HERS Index thresholds for many programs, whole-house mechanical ventilation systems have become standard in a vast majority of rated homes in many parts of the county. While whole-house mechanical ventilation systems are a required aspect of most ratings, there is a lack of clear understanding of how to verify and model these systems. Ventilation systems have up to 5 individual inputs that affect the HERS Index, and their verification requires raters to access different skill sets to correctly model these systems. The impact of correctly modeling these systems can affect the HERS index by several points.

This session will briefly review the current requirements for verification of whole-house mechanical ventilation systems, the process of gathering data/testing on-site, using online database for accessing third-party system rating data, and then entering the data accurately into the rating software.

Suggested Presenter(s): Chris McTaggart, Building Efficiency Resources

### **The Present and Future of RESNET Quality Assurance**

Join Scott Doyle and Laurel Elam with RESNET to hear an update on the current Quality Assurance amendment and the future of RESNET Quality Assurance.

Suggested Presenter(s): Scott Doyle, RESNET & Laurel Elam, RESNET

### **Streamlining the Process from Rating to RESNET**

To help Builders improve the way they build, there are steps and tools that can assist Providers and Raters in streamlining the entire rating process. In the past, ratings were more simplified, but over time additional requirements and quality assurance steps have created additional complexity. Builder clients are also asking for faster turn-around, better documentation, and more services. This session will look at the rating process from A-Z and present tools, resources, and a case study of how a Rater decreased the time for ratings, increased profitability, and improved rating accuracy and consistency – all while providing more value to their builders.

Suggested Presenter(s): Mat Gates, Residential Science Resources & Amber Wood, NORESKO

### **HERS Consistency - A Discussion from a Software Perspective**

The HERS Consistency Task Group has been looking at what changes can and should be made in order to make accredited HERS software produce a consistent HERS Index. This session will be a review of their findings and recommendations. Attendees will gain a better understanding of the calculation of the HERS Index and the challenges faced in producing a consistent HERS Index result. Format will be panel discussion with members of the Consistency Task Group.

Suggested Presenter(s): Nancy St Hilaire, Home Energy Group; Cy Cilbourn, Ekotrope & Brian Christensen, Noresco

### **Toward an Open-Source HERS Solution**

OpenStudio and EnergyPlus are open-source resources that support building energy modeling. Researchers at the National Renewable Energy Laboratory have been enhancing residential building modeling capabilities within the OpenStudio/EnergyPlus ecosystem. The ANSI/RESNET/ICC 301 Energy Rating Index rule set has been developed and added. A HERS-specific use case utilizing the HPXML data transfer standard has been developed. These resources will be made generally available to private-sector software providers. This session will provide an overview of this resource, an update on the current status, and plans for future development and use.

Suggested Presenter(s): Scott Horowitz, National Renewable Energy Laboratory; Bob Burns, Pivotal Energy & Amber Wood, NORESKO

### **Making Grade I Installation Training Effective and Repeatable**

HERS Raters are frequently frustrated by the difficulty of getting Grade I insulation installations. While there are a few reasons for this issue, a key challenge is providing consistent training, in a repeatable way, for installers and crew leaders to know what is expected in advance. In 2017, Appalachian State University began a program focused on providing quick, easy, accessible trainings to insulation installers around North Carolina focused purely on getting Grade I and why it mattered. Their approach was quick, easy and

popular with installers and business owners alike. This model holds the potential to scale and could be replicated by HERS raters as a value-added service to their builder customers to ensure quality outcomes (and the HERS points that come along with them).

Suggested Presenter(s): Chuck Perry, Appalachian State University Energy Center

### **Variability Assessments (VA) in Residential Single Family Dwellings**

Variability assessments (VA) identify discrepancies in results from multiple raters on a single home, for either projected or confirmed ratings. The assessments can be used as a training tool to identify areas of concern, or for quality assurance to assess areas where raters may be consistently missing key components of a rating. The quality assurance element can be conducted at the provider level, or as part of RESNET's overall quality assurance efforts. Guidelines for conducting VA also referred to as "round robins" were developed under a grant from the National Institute of Standards and Technology. These guidelines have been employed in a pilot research effort by WSU researchers working with a RESNET VA task group. The VA goal is to assess the variability of the HERS index, and improve the consistency of information to builders, efficiency program providers and code officials using the HERS index. The objectives included; 1) developing and implementing a variability assessment research pilot project, focused on proposed HERS ratings (for new construction), and 2) identify the key factors that impact variability in IECC level and high performance homes voluntary energy efficiency programs. The results of various VA efforts (RESNET, DOE, CA, NIST) will be presented. Presentations will focus on research questions:

- 1) What is the variability in HER score when all raters are given the same info?
- 2) What are the reasons found that help explain the HER score variability?
- 3) What specific feedback from VA research can be used to help reduce variability?

The session will provide an opportunity to share the results and perspectives that may support on-going RESNET efforts in this VA area.

Panel Moderator: Michael Lubliner, WSU Ext. Energy Program;

Presentations by:

David Hales, WSU Ext. Energy Program(TBD) - Results of RESNET VA 2016 Kentucky pilot

David Cohan, USDOE (TBD) - DOE VA research

Bruce Wilcox (TBD) - VA in CA new homes

William Healy, NIST (TBD) - VA with NZEH

Suggested Presenter(s): Michael Lubliner, WSU Energy Program

## Home Energy Ratings

### **There is an App for That - is back. Lets go to the next level ...**

This session will become a standard at RESNET conferences. Demonstrations of some of the best apps / devices for testing and performing many of the required measurements for a Rating. Measurements? We'll scan the room with Apple & Android devices and measure the room live. There are multiple different ways to measure a room or wall; we will demonstrate multiple apps that do this with ease. Want precision measurements - Laser devices that can send the readings to your phone/tablet - and provide an Excel sheet. Nice! How about duct testing on the fly or trying to find the leaks in the attic or crawl space and turning on/off the duct tester as you go. Handy! While standing in the living room, turn off the blower door fan so you can explain to your clients the conditions, then turn it back on and let them feel the air moving through the switch plate. These apps can do that. Creating a sketch up model of the home and export the surface area and volume. EnergyLogic has a solution and a training module. We'll demonstrate this in the session. But wait there is more... but you have to come to the session to see. If you want to see what's out there now and coming up next - this session is must for those who are on top of their game. Last year this session rocked and several asked me to update it and present it again. Here's a sample which includes James Hardie Contractor's Eye (aka Hover) must see app!

[www.dropbox.com/s/joy4mrhtmbtpqu8/Theres%20An%20App%20For%20That%20sample.pdf?dl=0](http://www.dropbox.com/s/joy4mrhtmbtpqu8/Theres%20An%20App%20For%20That%20sample.pdf?dl=0)

Suggested Presenter(s): Joe Medosch, Energy & Environmental Consulting llc

### **New construction & healthy homes: Observations & Measurements & for Raters**

New construction & healthy homes: Observations & Measurements & for Raters Formal studies and anecdotal experiences have homeowners thinking more and more about achieving a healthy indoor environment. Many factors play into this including siting; choice, installation and maintenance of materials, systems and furnishings; as well as the activities of the occupants. Come to this session to learn about some of the observations & measurements a Rater can make to help homeowners achieve a healthy home. Learning outcomes: 1) The health impacts of poor indoor air quality 2) Which materials, systems and furnishings and practices contribute to poor indoor air quality 2) Which materials, systems and furnishings and practices contribute to poor indoor air quality

Suggested Presenter(s): Bill Spohn, TruTech Tools, LTD

### **AirFlow Measurements 2018 Edition**

Airflow Measurements: 2018 Edition: Learn the wide variety of measurement methods and the pluses and minuses of each. Dig into the science behind good airflow measurement, as well as the importance of considering air density corrections. We will also cover the ins and outs of picking the correct tool for the measurement task or application. We will present test

data about relative accuracies of some of the measurement types. Every major airflow measurement tool and technique will be explored and explained, especially those impacting RESNET ratings.

Suggested Presenter(s): Bill Spohn, TruTech Tools, LTD

### **The Value of HERS Regional Associations**

There are a few regional associations supporting the HERS Industry, such as the Northeast HERS Alliance. This session will provide a panel of members from various associations across the country and highlight how they help strengthen, advance, and create consistency in the industry through training, feedback, outreach and industry support.

Suggested Presenter(s): Emelie Cuppernell, Performance Systems Development

### **The Independent Provider - What are they providing?**

The role of the Independent third party RESNET QA Provider has changed over the last decade along with changes in the industry, changes in standards, and changes with RESNET. What does a provider provide? What can a rater expect? How has this changed? What changes are expected to come? This session will cover the changing role of the Independent QA Provider and the range of services available.

Suggested Presenter(s): Emelie Cuppernell, Performance Systems Development & Ethan MacCormick, Performance Systems Development

### **Taking Innovative building to Energy Modeling - why does it take so long**

We have to engage industry players to collect data that demonstrates true performance. RESNET should outline a process for developing the collection of valid data sets so that manufacturers or others could legitimately present proposals to change the RESNET standards and intern more accurately model the energy performance of specific products or class of products or building techniques. Let's move from an organization that accepts the word of one or two to a truly data-driven standard-setting body.

Suggested Presenter(s): Steve Byers, EnergyLogic & Robby Schwarz, EnergyLogic

### **Making LEED Accessible for Single Family Builders: Success with Streamlined Production Certification, and Major Rating System Updates**

Learn about major new LEED For Homes Rating System updates that make LEED more streamlined and accessible for single-family builders. Hear how one rating company has successfully implemented the new production home certification pathway, which helps deliver LEED certification on a production builder timeline - including certification within a week of final inspection. USGBC has been hard at work to make LEED for Homes V4 more flexible and

accessible, specifically targeting the production home builder market with modified rating system requirements and point thresholds that reward best practices in high volume single family construction. In addition, a new certification pathway based on the DOE Zero Energy Ready Home program helps ease the transition from ENERGY STAR to LEED certification. Join Asa Foss, Technical Director of LEED for Homes, who's been putting all this together at USGBC, and Tom Flanagan, LEED Quality Assurance Manager for EnergyLogic, who's been making it all work in the field, to get the skinny on these transformative program updates – addressing the three major hurdles to making LEED digestible in a production environment: cost, timeline, and administration.

Suggested Presenter(s): Asa Foss, US Green Building Council & Tom Flanagan, EnergyLogic, Inc.

### **HERS Raters, HERS Ratings, and Code Compliance - The problem (opportunity?) with non-HERS code compliance ratings that receive no 3rd party oversight**

This session will have two parts:

- 1) Analytics part presented by Ekotrope: - How many houses are meeting the performance code using RESNET accredited software without being registered or QA'd (though a data analysis or a survey)? -Market conditions - What raters are charging for code compliance as compared to HERS ratings, time spent on code compliance etc.?
- 2) A panel with raters/provider discussing questions like: -How can we get more HERS ratings done in the code compliance market? - What are the key impediments? -How can technology assist?

Panel participants list includes Steve Saunders, Jeffrey Sauls, Brett Dillon, Robert Schildgen.

Suggested Presenter(s): Cy Kilbourn, Ekotrope; Steve Saunders, US-EcoLogic & TexEnergy; Jeffrey Sauls, Energy Vanguard; Robert Schildgen, Priority Energy & Brett Dillon

### **HERS, ENERGY STAR and Beyond! The Value of High Performance Homes and Energy Ratings**

NEEA, the Pacific Northwest's Regional Energy Efficiency Organization, has embarked on a mission to foster collaboration between multiple whole home certification programs and aggregate the data collected by the various programs to create a regional data hub of all above code certified homes. The aggregated address-level data is used for a variety of purposes, including: determining energy savings, informing code development and program design, tracking market activity and building trends, and more! This session will present the challenges of program collaboration, expand on the uses of the aggregated data, explore opportunities to develop new value propositions for home certification programs, and propose how raters, verifiers, and homebuilders can benefit.

Suggested Presenter(s): Neil Grigsby, NEEA; Matthew Christie, TRC; Mark Wyman, Energy Trust of Oregon & Bob Burns, Pivotal Energy Solutions

## **Adapting the HERS Index to Technology and How to change the RESNET/ANSI Standard**

The RESNET/ANSI/ICC 301-2014 standard is spot on in many cases, but on the flip side there are three distinct areas where changes need to be made. 1. Better integration with the realities of rating field work. 2. More data driven modeling guidance. 3. Faster and more accurate adoption of new technologies into modeling. The ANSI process gives everyone the opportunity to affect change. Manufacturers, Raters, Builders and others are concerned about proper modeling and the rating process. In order for the standard to continue to evolve, standard change proposals need to be more data driven. Data of all kinds is needed to drive accurate change, but we need to know and better understand how to get involved to successfully shepherd a proposal. This session covers the who, what, when, and why of proposing a change to the RESNET/ANSI Standards.

Suggested Presenter(s): Robby Schwarz, EnergyLogic; Ben Graham, EnergyLogic & Glenn Pease, EnergyLogic

## **One Standard, Multiple Software, Inconsistent Results?**

Has anyone compared the three most widely used software's? We have. From a Rater's perspective we will reveal our opinion of the pros and cons of the three most widely used Rating software's. How do they stack up and how are they working toward delivering consistent results. Some of the criteria for comparison include: - Usability/navigation - Functionality – HERS, Code, Programs -Reporting -Result alignment -Ease of troubleshooting - Help menus -Other Strengths & Weaknesses -Error messages -Software support

Suggested Presenter(s): Robby Schwarz, EnergyLogic; Ben Graham, EnergyLogic & Glenn Pease, EnergyLogic

## **Top 10 Things Every Rating\* Company Should Do**

There are many things every rating company must do to stay in business; once you've checked the necessities off the list, where do you go from there? As a large scale rating company, national QA provider, and software developer, EnergyLogic would like to share the top 10 things we think every successful rating company should do. Whether you're new to managing a business or have experiences to share, we'd love for you to join us in this engaging opportunity. *\*While we will focus on our experiences as an Energy Rating, Quality Assurance, and Software Business, we think any business area could benefit from this session.*

Suggested Presenter(s): Robby Schwarz, EnergyLogic; Steve Byers, EnergyLogic & Glenn Pease, EnergyLogic

## **Selling Yourself - The Value of a HERS Rater**

Key to most successful rating companies is their ability to sell. This requires understanding a potential customer's goals and aligning your services to deliver value. As a group, participants will work together to define the benefits of 3rd party verification services from a builder's perspective and agree on a list of typical builder profiles. From there you will design ideal ways to communicate value to builders based on a variety of priorities. You'll leave with up to three value propositions for builders highlighting how your services create value for a client.

Suggested Presenter(s): Shaun Hassel, Advanced Energy & Dan Wildenhaus, CLEAResult

## **Be the first to happy hour: 10 Hacks to Streamline the Rating Process**

Remember when your job had a clear end to the day, as opposed to a series of never ending fires? When you used to make it to happy hour by 3:30? Luckily for you, we've reached out to leading raters from across the nation to document what they are doing to streamline the entire rating process from start to finish. Whether it is a hack to speed-up performance testing, a processes to simplify modeling, or creative communication methods with builders and trades, there are any number of ways that we can all do our jobs more efficiently without sacrificing quality. Attend this session to see and hear ten examples that raters are using to make their job easier and more enjoyable; apply them immediately to save yourself time, money and hassle!

Suggested Presenter(s): Shaun Hassel, Advanced Energy & Dan Wildenhaus, CLEAResult

## **ANSI/RESNET/ICC 301 and the New ASHRAE 90.2**

ASHRAE Standard 90.2 is undergoing a major revision to transform it into a performance-based standard, which uses ANSI/RESNET/ICC 301 as the base methodology. This presentation will discuss the new direction of Standard 90.2 to become a leadership standard that has performance at least 50% more efficient than the energy efficiency defined by the 2006 IECC. The addition of the new Standard 90.2 to the industry portfolio allows benefits of having a range of energy efficiency levels based on the same base ANSI/RESNET/ICC 301 criteria. This presentation will discuss how the new 90.2 standard references ANSI/RESNET/ICC 301 to create an accurate, flexible performance-based tool that enable user creativity in meeting the performance objectives.

Suggested Presenter(s): Philip Fairey, Florida Solar Energy Center; David B. Goldstein, National Resources Defense Council & Theresa Weston, DuPont Protection Solutions

## **How RESNET Helps You Market HERS to Builders (and Others)**

Need help marketing HERS? Whether you're new to the industry or need a helpful refresher, plan to attend this session to learn what RESNET resources are available to help you market your rating services to builders, homeowners, and others. You can also offer suggestions on additional RESNET resources that would be helpful to have in the future.

Suggested Presenter(s): Valerie Briggs, RESNET

### **RESNET Provider Roundtable**

Got an issue and wonder how other providers have handled it in the past? Or maybe you have feedback you'd like to share with RESNET? Then join us for this interactive, constructive session designed to gain valuable ideas and net solutions to common issues. Come and share with colleagues, offer opinions, and engage in thoughtful discussions regarding topics relevant to the ratings industry.

Suggested Presenter(s): Valerie Briggs, RESNET

### **Time is Money: Valuing When Energy is Used**

Residential buildings use 40% of the electricity in the US, and often comprise over 50% of the utility peak demand. Utilities are increasingly adding variable renewable energy sources to their systems, both large supply-side systems and distributed systems like rooftop solar. While higher penetrations of renewable energy bring many benefits, their variability creates new challenges for electric utilities. Buildings can play a key role in facilitating variable generation when they are flexible. Increasingly, when buildings use energy is becoming more important than how much energy they use. To stay relevant, HERS will need to adapt to this new paradigm by *valuing when energy is used*, and accounting for the technologies that enable flexibility -- onsite generation, storage, and controls. Dave will lay out a vision for getting from where HERS is now to where it needs to be in the future.

Suggested Presenter(s): Dave Roberts, National Renewable Energy Laboratory

### **The Purpose of RESNET: Why it Matters to You and How to Get Involved**

This session will outline RESNET's Mission and Vision, why the type of non-profit matters, and dispel common myths about what the organization is and is not. Then we will explore the inner workings of the organization- how priorities are set, initiatives are driven, and standards adopted. Finally, we discover the various ways to get involved- from the election of RESNET Board Members to SDC Working Groups and anything in between.

Suggested Presenter(s): Steve Baden, RESNET & Rick Dixon, RESNET

### **What if Uber or AirBnb Happened to the Home Building Industry?**

The combination of new and/or repurposed technology plus an innovative business plan has led to significant market disruption for a number of industries over the last few years. Did the Big Cable companies see the threat Netflix would pose to their happy existence? Could Blockbuster have anticipated RedBox in time to reinvent themselves and salvage their own future? One could argue that market disruption is like the Grim Reaper. It will come for

everyone eventually. It's been a fact of life since before tire shops replaced the livery stable. Is there any reason to think the home building industry immune? This session will explore some of our favorite "innovative" technologies and business plans and imagine what could truly disrupt the home building market. Will the HERS Rater still have relevance in this imagined future? Come to this thought-provoking session and find out. (Warning: Audience Participation is advised)

Suggested Presenter(s): Colby Swanson, Momentum Innovation Group; Ari Rapport, IBACOS & Steve Byers, EnergyLogic

### **RESNET Communications Plan**

RESNET has taken a big step to having more effective communications with the hiring of Valerie Briggs as RESNET's Communications Director. A key first responsibility for Valerie is to develop a communications plan for the organization. The communications plan will be based on a series of online surveys to RESNETs' key stakeholders. This session will present what is planned for RESNET's communications plan and seek feedback.

Suggested Presenter(s): Valerie Briggs, RESNET

### **RESNET Emerging Leadership Council**

To remain sustainable the HERS Industry needs to cultivate leadership from the new generation. X generation and Millennials communicate in different form than Baby Boomers who gave birth for the industry. In order to remain relevant the industry must recruit, mentor and nurture the next generation of leaders.

To meet this need RESNET has formed the RESNET Emerging Leadership Council.

A special feature of the 2017 RESNET Building Performance Conference is the session "Cultivating a New Generation of Leadership in the HERS Industry". This session will be a forum led by and aimed at the next generation of leaders.

Topics of discussion will include:

- Why a RESNET Emerging Leadership Council?
- Discussion of possible activities of council
- Interactive and fun polling of participants throughout session
- How you can get involved and remain sustainable the HERS Industry needs to cultivate leadership from the new generation.

Suggested Presenter(s): Valerie Briggs, RESNET & Matt Gingrich, Energy Diagnostics

### **RESNET HERS Associate Certificate Program**

With the increase in the demand for HERS Ratings builders are increasingly requesting suppliers to relate what contribution the product would have on their homes' HERS Index score. Suppliers were seeking a way for their staff to be able to answer the question without the time and expense of their staff going through the full HERS Rater training. To meet this need RESNET has created a new designation the RESNET HERS Associate. This new RESNET certificate level designation is essential for anyone needing a working understanding of RESNET and HERS for uses other than conducting ratings.

The HERS Associate is targeted for supplier employees, but is also applicable to, architects, engineers, code officials, builders, trade sub-contractors, appraisers, or advocacy groups. With the increase in the demand for HERS Ratings builders are increasingly requesting suppliers to relate what contribution the product would have on their homes' HERS Index score. Suppliers were seeking a way for their staff to be able to answer the question without the time and expense of their staff going through the full HERS Rater training.

To meet this need RESNET has created a new designation the RESNET HERS Associate. This new RESNET certificate level designation is essential for anyone needing a working understanding of RESNET and HERS for uses other than conducting ratings.

The HERS Associate is targeted for supplier employees, but is also applicable to, architects, engineers, code officials, builders, trade sub-contractors, appraisers, or advocacy groups. This session will explain the benefits of the RESNET HERS Associate and how to become a training organization.

Suggested Presenter(s): Kathy Spigarelli, RESNET

### **RESNET Multifamily Standard**

At the 2017 RESNET Better Buildings Conference, it was announced that Law and order was coming to the Wild West of multifamily ratings! Since then, the existing Multifamily guidelines have slowly been churning through the ANSI standard development process. Come hear the latest developments on this important new standard presented by members of RESNET's Multifamily Subcommittee, who have built upon the existing Multifamily Guidelines in support of developing a Standard dedicated to Multifamily.

Suggested Presenter(s): Thiel Butner, Pando Alliance; Brian Christensen, NORESKO; Gayathri Vijayakumar, Steven Winter & Rebecca Hudson, EPA

### **Remote QA Pilot- Best Practices and Lessons Learned**

In 2017, the RESNET Board established a priority to support adoption of HERS ratings and the HERS Index in Rural America. One aspect of this issue is the high cost and relative difficulty of meeting RESNET Quality Assurance requirements in these hard to reach locations where rating volume is lower and travel distance for the QAD is exponentially higher. Remote QA represents a possible solution to this problem. But in order to earn acceptance, first a proven process must be demonstrated and proper guidelines/best practices established. East Kentucky Power Cooperative engaged in a pilot program with RESNET to test a Remote Pilot

QA Checklist. This session will describe the challenges, successes, and lessons learned from that pilot effort.

Suggested Presenter(s): Josh Littrell, East Kentucky Power Cooperative

### **Insulation Expert Panel**

Having a panel of manufacturers speak on the do's and don'ts of proper insulation and how it will impact a home's rating. The same people who spoke on Compartmentalization and Air Sealing Party Walls last year would be good candidates for this. Having Jordan Doria on the panel may also be beneficial.

Suggested Presenter(s): Clint Shireman, Knauf; Ted Winslow, Certainteed; Tom Calzavara, Johns Manville; Craig Marden, Owens Corning

### **Multifamily Ratings - what is needed in HERS Rating Software?**

Multifamily buildings are the hot new trend in the US. Developers are building apartments to catch up on a lull of construction over previous years in a race to complete projects and capitalize on continuously rising rents. Investors are aggressively seeking opportunities to purchase multifamily properties, specifically core and value-add assets in top-tier markets. Given the rise in multifamily construction:

- What are the challenges facing providers and raters with modeling numerous units in multifamily buildings?
- How do these challenges affect raters and providers?
- Is existing HERS Rating software up to the task?
- What changes can be made in HERS Rating software to improve the efficiency with rating multifamily units?

This session will explore concepts to improve HERS Rating software efficiency for rating multifamily buildings/units. There will be a discussion at the end of the session to address these concepts as well as thoughts from the audience.

Suggested Presenter(s): Robert Salcido, Salcido Solutions

### **The Future of Standard 301 - The First Major Update - 2019 Edition**

RESNET's first American National Standard, Standard ANSI/RESNET/ICC 301-2014, is scheduled for its first 5 year Update in 2019. Standard 301 was first based on RESNET's HERS rating standards and was derived mostly from Chapter 3 of the Mortgage Industry National Home Energy Rating Standards. Since its first adoption Standard 301 has undergone significant changes via the addition of a number of addenda. Those addenda and interpretations that have been issued since 2014 will be integrated into Standard 301-2019 and a number of additional significant enhancements are also being developed. Work began in the second half

of 2017 and will continue through 2018 with January 2019 as the target for completion. The plan, schedule and highlights of major changes for the 2019 Update will be presented during this Conference session.

Suggested Presenter(s): Brett Dillon, RESNET SDC 300 Chair; Philip Fairey, RESNET SMB Chair; Rick Dixon, RESNET Standards Manager

### **What do to When a Builder Challenges the Results of your HERS Rating?**

Join this discussion to hear experiences from raters and rating providers when homebuilders challenge the results of the HERS Ratings and how both parties come to a resolution.

Suggested Presenter(s): Chris MCTaggart, The BER & Rater Panel (TBD)

### **How to Properly Implement the RESNET Sampling Protocol**

New to sampling? Just want to be sure you are properly implementing the sampling protocols? Come to this session to learn how to implement RESNET's Sampling protocol!

Suggested Presenter(s): Scott Doyle, RESNET & Gayathri Vijayakumar, Steven Winter

### **So, What Does Grade I Insulation Really Look Like?**

This session will provide insight into exactly what Grade I insulation really looks like as well as include an update to the revisions to RESNET Standard Appendix A on Insulation Installation.

Suggested Presenter(s): Dan Wildenhaus, CLEAResult & Charlie Haack, NAIMA

### **The Genie is out of the Bottle! What we have Learned so far from QA Genie**

Join Scott Doyle and Laurel Elam with RESNET to discover the findings from the first year of analysis of QA Genie, RESNET's Rating evaluation tool.

Suggested Presenter(s): Scott Doyle, RESNET & Laurel Elam, RESNET

### **Interpretations, Amendments and Addendums Oh My!**

Rick Dixon, RESNET's Standards Manager, will provide an update on MINHERS and ANSI Standard amendments and review the process for submitting standard amendments and interpretations to the RESNET and ANSI Standards.

Suggested Presenter(s): Rick Dixon, RESNET

### **The roadmap for future RESNET ratings standards (to include the merging of Standards 301 and 305 and moving to the Continuous Maintenance MINHERS)**

RESNET has developed or is in the process of developing a suite of energy rating related standards that will cover the majority of residential dwelling units and homes. Standards ANSI/RESNET/ICC 301-2014 and ANSI/RESNET/ICC 380-2015 provide consensus standards for rating and the testing essential to rating homes and dwelling units in buildings containing multiple dwelling units. The RESNET Multi-Family Guidelines that are being converted into standards criteria following the ANSI requirements for American National Standards that will expand ratings to dwelling units in buildings greater than 3 stories above grade plane. These American National Standards are adopted and adapted for the technical components of the proprietary RESNET HERS. As the RESNET American National Standards and the RESNET HERS standards evolve the approach to their development and maintenance is evolving to be more user friendly and easier for RESNET to coordinate. This session will identify the plan for development and presentation of RESNET's energy rating system.

Suggested Presenter(s): Philip Fairey, RESNET SMB Chair Rick Dixon, RESNET

### **REDUCING SOFT COSTS TO MAKE SOLAR MORE AFFORDABLE TO THE AVERAGE HOMEOWNER.**

Recommendations will be presented for how the solar and construction industry can reduce indirect or "soft" costs in order to make solar more affordable to homeowners, especially homeowners wanting to add solar to existing homes.

Suggested Presenter(s): RESNET Staff

### **WHAT CAN WE DO TO IMPROVE OUTDOOR LIGHTING EFFICIENCY FOR HOMES AND CITIES?**

For Raters using HERS, this session will examine products and methods to increase outdoor lighting efficiency.

Suggested Presenter(s): RESNET Staff

### **HOW STATE AND NATIONAL POLICIES IMPACT AND INFLUENCE HOMEOWNERS AND OUR NATION IN THE ENERGY EFFICIENCY ENVIRONMENT; HOW CAN RESNET TAKE ADVANTAGE OF OR OFFSET THESE POLICIES?**

Tools to navigate policy changes and to keep raters ahead of changes in the HERS industry will be presented.

Suggested Presenter(s): RESNET Staff

### **RESNET ACCOMPLISHMENTS ON QUALITY ASSURANCE AND STANDARDS DEVELOPMENT.**

This session will present goals reached and improvements made on Quality Assurance and Standards Development, including software consistency.

Suggested Presenter(s): RESNET Staff

### **MAKING RESNET "HERS" LABELS THE MPG STICKER FOR EVERY HOME.**

This session will focus on how to make HERS the rating system standard used in both new and used homes.

Suggested Presenter(s): RESNET Staff

### **HOW TO COMPETE WITH "HERS" DURING THIS POLITICALLY UNCERTAIN TIME**

With the current, uncertain political environment, RESNET/HERS must compete effectively in the market. Tools Raters and Trainers can use will be presented while looking at opportunities and threats.

Suggested Presenter(s): RESNET Staff

### **PROMOTE OUR "BEST IDEAS" SESSION THEME AS "Reaching the Next 2 Million Homes" or "Going Beyond 2 Million Homes."**

Encourage participants at "Best Ideas" Session to make suggestions on how RESNET and HERS can continue or improve the momentum since RESNET reached the 2 millionth rating in 2017.

Suggested Presenter(s): Kathy Spigarelli, RESNET Staff

### **What are "Buried Ducts" and how do you model them?**

2018 IECC explicitly allows the use of buried ducts in standard vented attics. This practice offers the energy savings that can rival certain unvented attics designs but at a lower cost. Because of this, many builders are beginning to pilot this new approach. The code lays out details both for proper design, specification and installation of buried duct systems as well as prescribing methods for accounting for them in energy models when using the performance path or ERI. In this session, we will provide attendees with an overview of the latest code change as well as a step-by-step walkthrough of how to model this approach using REM/Rate, EnergyGauge and Ekotrope. Attendees will leave knowing more about a significant new code change and how to help their builder customers incorporate it, and model it, in the homes they build.

Suggested Presenter(s): Charlie Haack, NAIMA

## **How Standards are evolving to better address Multifamily Ratings**

Updated and revised language for multifamily ratings and testing has been presented for public comment, and court is in session! Come to hear the latest and ask questions. Session is presented by members of RESNET's Multifamily Subcommittee, who used the existing *Guidelines for Multifamily Ratings* as a springboard to develop a draft of a new Standard (ANSI 305) that better addresses Sampling, inspections, and the calculation of an Energy Rating Index for units in multifamily buildings. The Subcommittee has also proposed an Amendment to ANSI 380 to provide specific testing guidance for multifamily. In addition to providing an overview of the proposed Standard and Amendment that went out for public comment, we will be sure to discuss:

- 1) The many definitions of multifamily
- 2) How the Standards development process for multifamily ratings has evolved over the past year, and
- 3) The status of the public comment process, common comments received, and what happens next.

Suggested Presenter(s): Thiel Butner, Pando Alliance; Gayathri Vijayakumar, Steven Winter & Brian Christensen, NORESCO

## **Don't be a tool, use the best tools!**

When achieving certification for green building and to ensure that the products and processes we use will deliver as promised, we often rely on third party rating systems, scoring tools, and supplemental certifications. But sometimes the landscape gets muddled and we need help deciding which tools best suit our needs and help us deliver at the best cost for our clients. For water efficiency, do you use the Water Efficiency Rating Score or the Water Efficiency Rating Index? For materials selection, stick with the Red List or utilize the new Google healthy products list? For energy efficiency, the HERS Index, the Home Energy Score, or the Energy Performance Score? These competing tools, scores and more will be looked at during this session with overarching guidance provided as to how to best incorporate this wide range of tools? Join Dan as we look at new tools on the market and ask ourselves if our existing tools are doing the job.

Suggested Presenter(s): Dan Wildenhaus, CLEARResult

## **RESNET Rating Provider Roundtable**

In this session, Rating Providers are encouraged to join in an interactive session during which this critical aspect of the RESNET HERS Rating industry will have the floor. While HERS Raters, Builders, the RESNET Board and its Sub-Committees are often the primary focus of the RESNET conference and its technical sessions; this open discussion will be moderated by PEG LLC Senior Vice President; Matthew Cooper in an effort to give Rating Providers of all types and sizes the chance to collaborate, strategize for improved market up-take and even help set the

stage for the future of our industry. There will be several specific session segments that will provide delineation of primary subject matter followed by an open discussion period. Participants who wish to voice their thoughts in a specific discussion segment should look for a pre-conference online sign-up page to ensure they will have a designated seat.

**Format:**

Opening Statement and Welcome

**Segment One: Rating Providers Perspective on the State of the New Construction Market and the Effectiveness of RESNET/HERS Recognition & Market Penetration**

20 Minutes with Moderated Panel

Five Primary Reserved Seats

Open Floor Commentary

**Segment Two: Rating Providers Outlook on the RESNET Progression Towards Enhanced QA**

20 Minutes with Moderated Panel

Five Primary Reserved Seats

Open Floor Commentary

**Segment Three: Rating Providers Role in Advancing the Future of HERS Ratings and RESNET as an Industry Leader**

20 Minutes with Moderated Panel

Five Primary Reserved Seats

Open Floor Commentary

**Segment Four: The Role of RESNET HERS Raters and their Providers as recognized professionals for non-HERS programs. What are the implications for: Quality Assurance/Quality Control/Professional Liability/Code of Ethics**

20 Minutes with Moderated Panel

Five Primary Reserved Seats

Open Floor Commentary

**Segment Five: Open Floor Discussion**

20 Minutes of Open Floor Conversation

Suggested Presenter(s): JoAnn Spence, PEG & Matthew Cooper, PEG

**The Truth Behind the Walls, Revisited**

The performance of your home is dependent on the three principles of energy movement, Conductive, Convective and Radiant energy. Unfortunately we cant see or measure the energy without specialized tools like blower doors and thermal imaging cameras. This presentation will revisit a paper we wrote 12 years ago on our experience in a new home and how thermal imaging was a very effective tool in seeing where the thermal breaks in our home were.

Today we have now just completed our brand new home build so we decided to revisit this dozen year old paper to talk about the differences between them and now (or is there)?

Suggested Presenter(s): Peter Hopkins, United Infrared

## **See the invisible with a Thermal Buddy for your Smart Phone**

A tool we all likely carry (smart phone) can now help you have vision like superman with a simple attachment. This presentation will demonstrate the latest in smart phone infrared technology available on the market today and how some simple apps available will help you see the unseen when it comes to heat loss in a building.

Suggested Presenter(s): Peter Hopkins, United Infrared

## **Opportunities for HERS Raters with the International Energy Conservation Code**

### **Alternate Means and Materials for Code Compliance**

HERS practitioners and RESNET are becoming increasingly involved in determining energy code compliance. Understanding how to determine whether new materials and systems meet code is critical to this activity. The primary mechanism for approval of innovative materials and systems is through their evaluation as Alternate Materials and Methods: “The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. The code official shall be permitted to approve an alternative material, design or method of construction where the code official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code.” This program will provide basics of material and system code approval. Describe the role of evaluation service agencies and the process of obtaining a code evaluation report. The presentation will also describe how these reports are used in field approvals of new products and systems. Suggested Presenter(s): Theresa Weston, DuPont Protection Solutions

### **Navigating choppy waters: what to know in order to consult with builders on energy code compliance**

As Raters and consultants, we hope to bring our expertise to market in helping our builders and designers meet codes in the most cost effective manner, and in the ways that align with their construction and business goals. One of the challenges is determining which methods of meeting the energy code offer the greatest flexibility between Prescriptive, Prescriptive with Trade Offs, Simulated Performance Alternative, and Energy Rating Index Alternative. Additional challenges arise in which pathway requires the most strict limitations on energy consumption or efficiency targets. In this session, we'll look at the most common limitations for each pathway, the tools of the trade Raters and consultants will need to be familiar with, and the completeness (or lack thereof) in directions provided to Raters. This is an introductory course for Raters that are looking to expand their consulting into recommendations for code compliance and will pinpoint what tools and resources are necessary to do the job well.

Suggested Presenter(s): Dan Wildenhaus, CLEARResult & TBD

## **Fire Code vs. Energy Code**

Pure and simply, there is a disconnect between fire codes and Energy codes. The two most common and frustrating examples are area separations walls and fire sprinkler installations. This session will explore this disconnect, offer potential solutions, and a path forward for approaching code officials and builders.

Suggested Presenter(s): Robby Schwarz, EnergyLogic

## **ERI vs. Performance Path: Which is better for your Builder?**

Let's be real... While the ERI path provides a sales and marketing opportunity for your Builder client, it requires significantly more from a builder in the 2015 IECC than the simulated performance path. Therefore, if you are offering code compliance services to your clients you not only need to have in depth knowledge of all the pathways available to demonstrate compliance, but you need to know what is the most cost effective way to achieve your builders' goals. This session will ensure you have a precise understanding of the different pathways and an understanding of the most flexible/cost effective means to achieve code compliance.

Suggested Presenter(s): Robby Schwarz, EnergyLogic

## **The Role of Raters in Code Compliance Verification**

With the incorporation of the Energy Rating Index in the two most recent editions of the IECC, and building inspectors retiring in record numbers; HERS Raters are commonly being looked to as the professionals with the experience to verify compliance with residential energy codes. To gain the trust and confidence of the code officials that are often responsible for approving third parties for compliance verification, Raters should consider getting ICC's Residential Energy Inspector/Plans Examiner Certification. This session walk you through the process of getting the certification and explore what RESNET's role should be for homes where Raters verify compliance, but do not provide a HERS Rating.

Suggested Presenter(s): Ryan Meres, RESNET & Chris McTaggart, Building Efficiency Resources

## **What's New with Codes and Standards**

RESNET entered the standards world with the introduction of Standards 301 and 380 and their reference in the IECC. But several hundred other standards are also referenced in the I-codes, many of which are important to the rating industry. New standards and revisions to standards are proposed and adopted every year. This presentation will review new and upcoming developments in standards, which intersect with RESNET and I-codes, including those from ASTM and ASHRAE.

Suggested Presenter(s): Mike Barcik, Southface Energy Institute & Bourke Reeve, Southface Energy Institute

### **Illustrating the IECC**

Why is the energy code so hard to understand? One issue concerns the different philosophical approaches of prescriptive versus performance. Another concerns the "code speak" that makes complicated concepts even harder. Learn how to unpack the code and steer others into a better understanding of its content. Methods we've found successful to deliver a home that truly is efficient include the use of short videos, electronic compliance tools with example problems, illustrative graphics, field guides and clarifying amendment language and commentary.

**Suggested presenters:** Mike Barcik, Southface Energy Institute; Bourke Reeve, Southface Energy Institute

### **Wrastling an Alligator - Free Technical Materials to Help in the Field**

Juggling your time between marketing, sales, logistics, educating and testing can be a handful. In particular educating installers and setting the state for smooth and successful testing and ratings can be like wrastling an Alligator. In addition to your own company collateral and product supporting documentation, did you know that the [successwithcode.com](http://successwithcode.com) website has tons of free visual how to guides for code compliance (2009-2015) and related above code programs? This presentation will go over this free resource and the features and benefits it can provide more value to your business as well as help free up your time for other business interests.

Suggested Presenter(s): Jonathan Coulter, Advanced Energy & Darren Meyers, P.E., International Energy Conservation Consultants

### **What it means to be an ANSI/American National Standard and how ANS work with building codes**

The designation of an industry-developed standard as an American National Standard (ANS) means the standard applies to more than the self-interest of the organization that developed it. Historically, "industry standards" were not accepted for reference in model building codes because they could be designed to promote the self-interests of industries and not necessarily the interests of the public. Adopting standards development procedures that ensure representation of users of a product or service the standard addresses and the general public as well as product manufacturers or service providers, consensus decision making processes and the opportunity for the public to comment on and challenge draft standard provisions allows organizations to have the standards they develop recognized as ANS and facilitates their recognition by model building codes developers. What it takes to develop American

National Standards and the role they play in model building codes will be discussed during this session.

Suggested Presenter(s): Ryan Meres, RESNET & Rick Dixon, RESNET

### **What Are "Buried Ducts"? Do They Work, And How Do You Install Them?**

2018 IECC explicitly allows the use of buried ducts in standard vented attics. This practice offers energy savings that can rival certain unvented attic designs but at a lower cost. Because of this, many builders are beginning to pilot this new approach. The code lays out details both for proper design, specification, and installation of buried duct systems as well as prescribing methods for accounting for them in energy models when using the performance path or the ERI. In this session, we will review the science related to the performance of buried ducts and discuss the practical aspects of an effective installation. A secondary session will provide an overview of effectively modeling buried ducts using various software packages. Attendees will leave both sessions knowing more about a significant new code change and how to help their builder customers incorporate it, and model it, in the homes they build.

Suggested Presenter(s): Katrina Keeley, Owens Corning; Mark Smith, Owens Corning & Builder, TBD

### **The Glide Path to Success - From Energy Code Verification to Ratings and Beyond**

Pilots follow a specific glide path to land a plane. Similarly, Raters can follow a stepwise approach to landing a client. Raters are the best-equipped housing industry professionals to provide a variety of services to builders: from blower door testing to above-code programs like Energy Star, DOE Zero Energy Ready Home, and Passive House. With much talk about the Energy Ratings Index Path in the 2015 and 2018 International Energy Conservation Codes (IECC), it is easy to lose track of the intermediate steps that may help Raters get a foothold with clients and then steadily increase their services. The model code has long held opportunities for HERS Raters. Starting with the 2009 IECC, duct leakage testing became mandatory (unless all ducts are inside). The 2009 IECC also mandates a blower door test or visual verification of air sealing and insulation details. In the 2012 IECC, blower door testing became mandatory in addition to the visual inspection(s). The 2015 IECC added the ERI path, with Index scores ranging from 51 to 55. The 2018 made the ERI path more accessible by increasing the maximum Index scores to 57-62, while clarifying the role of renewables. All the aforementioned codes also include the Simulated Performance Alternative – very similar to a rating – and the “above-code programs” provision, where participation in recognized energy programs may be accepted for energy code compliance. This session will review the details of the Rater glide path and discuss how to develop relationships with builders and code enforcement officials to expand their businesses. I have not contacted any raters yet, but I am happy to combine forces with anyone who's interested. For example, I have presented with Robby Schwartz before...

Suggested Presenter(s): Mike Turns, Performance Systems Development

### **Getting Credit - Tips for Simplifying Code Compliance**

Understanding today's energy codes already creates a unique new challenge for Home Energy Raters. Determining the builders needs for meeting the energy code while balancing cost and structural requirements can be difficult. This presentation will look at common building construction practices in climate zones 3-5 and identify assemblies and credits that can be utilized for both ERI and simulated performance path compliance. Flexibility is often the key to whole home energy performance and cost effectiveness. This session will explore options that balance energy losses with measures that have greater efficiency gains to deliver a code compliant, energy efficient home.

Learning Outcome 1:

Understand the different methods for compliance with the 2015 IECC, including the opportunities and obstacles of the performance pathways and how performance based energy code compliance can play into your business model.

Learning Outcome 2:

Recognize common challenges faced by today's Home Energy Raters when using performance based energy code compliance and how to avoid and overcome them.

Learning Outcome 3

Learn the importance of finding the proper balance between cost effectiveness, structural stability, and energy efficiency for energy code compliance.

Learning Outcome 4

Develop an understanding of where energy (ERI Points) can be easily gained or lost in each climate zone for different assemblies or installed options and how to use the points.

Suggested Presenter(s): Matthew Brown, APA-The Engineered Wood Association

### **3rd Party Energy Inspections under the 2015 IECC**

Jim Hemsell is a HERS Rater since 2000 and been a Texas Home Inspector since 1983. In 2008, The Dallas / Fort Worth area started experimenting using 3rd party energy inspectors and green building inspectors to perform energy code inspections for the city using the 2006 IECC. Things have changed a lot since then as he has built Infrared - A Closer Look Inc. Today IACL generates energy reports, Manual J, S & D reports for properties around the country and performs energy code inspections, blower door test and duct pressurization test in 32 different municipalities in the DFW area. Jim and his inspectors are level 1, 2 and 3 Thermographers that blend that discipline with their inspections to help meet the market demands.

Suggested Presenter(s): Jim Hemsell, Infrared - A Closer Look Inc. & Doug Moon, Infrared - A Closer Look

## **Tapping the Appraisal and Real Estate Market**

### **Moving Energy Data into the MLS**

Transforming housing markets to value energy performance will require the widespread awareness of home energy efficiency information by buyers and sellers. This is only going to happen if we are successful at evolving Multiple Listing Services (MLS) to include energy information. Activities with MLS's are underway in at least half a dozen jurisdictions in the U.S. including the Northeast, North Carolina and other Southeast states, California, Colorado and Oregon. We will provide a survey of some of these MLS-oriented activities and walk through some case studies of leading efforts that are actually currently auto-populating local MLS systems with HERS, Home Energy Score and other energy information.

Suggested Presenter(s): Richard Faesy, Energy Futures Group; Bob Burns, Pivotal Energy Solutions; David Heslam, Earth Advantage; Ryan Miller, North Carolina Building Performance Association

### **What Raters Need to Know About Appraisals**

With the launch of RESNET's "Appraiser Portal", residential appraisers will have access to even more information to assist with the valuation of a home's energy performance. The Appraiser Portal allows appraisers to verify the HERS Index Score for a home they are appraising and then search for comparable homes in the area with similar HERS scores. The portal also indicates whether a home is Energy Star Certified and provides the appraiser with the the estimated annual energy cost and estimated annual energy savings. This session will provide a demonstration of the portal and offer key insights on how to talk to appraisers about using the portal.

Suggested Presenter(s): Sandy Adomatis, Adomatis Appraisal Services

### **Incorporating HERS Index Into the MLS**

Lack of consumer awareness for the HERS Index was identified as a weakness in a SWOT analysis done by the RESNET Board several years ago. Since that time, momentum has grown for the inclusion of the HERS Index in local and regional MLS listings across the U.S. This session will celebrate the key successes with MLS listings and offer attendees some actionable ideas for increasing consumer awareness and driving demand for HERS ratings in their local areas.

Suggested Presenter(s): Ryan Meres, RESNET & Shawna Cuan, Utah Office of Energy

## **Social Media 101**

Session for business owners to master social media, which platforms to use, and the best way to reach clients.

Suggested Presenter(s): Peter Troast, Energy Circle, LLC

### **Green Bonds Based on HERS Index Scores**

Investors with over \$70 trillion in assets want to buy green bonds and stocks causing the green bond market to grow to \$93 billion in just four years with bonds oversubscribing 3x+, providing cheaper capital, more bond proceeds, and less risky bonds (Green Bond Business Case 2014). This demand / supply imbalance also caused green bonds to be more valuable than conventional by 20 basis points and rising (Barclays 2016). Fannie Mae provides owners a 20-30 basis point incentive for green apartment bonds, and Freddie Mac gives more proceeds. DC Water's \$300 million green bond received orders for \$1.1 billion and was issued at \$350 million also increasing its investor base and reducing reputational risk

Green bonds and their underlying assets were documented in 10 years of statistically valid data as more profitable, less risky, and preferred by investors (Green Bond Business Case 2014). For example, statistically, green buildings have highest rents, occupancy, valuation, cash flow, and occupant productivity, with 40% increased retail sales according to Pacific Gas & Electric (Id.).

There is less risk as well. Statistically, green homes have 32% fewer defaults.

These Green Home Bonds achieved higher credit ratings based on 22 green home underwriting attributes increasing bond cash flow including higher appraisal, insurance discounts and HERS Index Scores.

Morgan Stanley will buy loans for the first \$100+ million publicly traded and rated bond to start the market, and will engage loan aggregators for the subsequent bonds which will be \$500 million minimum.

This session will explore the power of green bonds and discuss what the implications will be for the housing industry.

Suggested Presenter(s): Mike Italiano, Capital Markets Partnership

### **How RESNET Helps You to Market HERS to Builders**

RESNET Resources (provide an overview of some of our various resources and solicit feedback on what new resources raters or builders would find helpful)

Suggested Presenter(s): Valerie Briggs, RESNET

### **The Right Contract**

A session for business owners to learn what should and shouldn't be in their contract with a client Rater Relationships – the "how" of building relationships with contractors, home owners, and builders and the benefits from it

Suggested Presenter(s): Dean Moody, Intermountain West Insulation

### **HERS Index in the Market Place**

Real estate appraisals play a critical role in the housing market. The appraisal drives what can be financed in the mortgage loan. If the appraisal fails to find market value in a feature of the home, it has to be paid for out of pocket. Traditionally residential appraisers have had a challenge with home energy performance. Many of the features that make a home energy efficient are hidden when the drywall is installed. In addition, building performance is based on whole house principals that are hard to show in a check list that can be compared to other homes in the market where homes may use different products and building practices to achieve the same performance. Finally, appraisers are not able to find the data they need to compare similar homes in the market.

This is about to change with the new partnership between the Appraisal Institute and RESNET. The two organizations have cooperatively developed an access to the RESNET Registry so that residential real estate appraisers can search 24/7 in real time the following information:

The HERS Index score of a home

The HERS rating company that rated the home

The date the home was HERS Rated

The projected energy savings of the home

This session will describe how access to this critical information will be a game changer in terms of real estate appraiser evaluation of the energy performance of a home as part of the appraisal process. Raters and other stakeholders in the industry will come away with an understanding of how this solution for real estate appraisal of energy features solidifies the relevance of the HERS Index -and thus the rater- well into the future.

Suggested Presenter(s): Sandy Adomatis or other AI Representative & Steve Baden or other RESNET Staff

### **Getting Past The Granite - It's On Us!**

Stop complaining about Realtors, Appraisers, and Consumers not recognizing value and fix it. Building science education has been part of homebuilding and remodeling for years. So why aren't the people showing and selling the homes so uninformed? Bottom-line: It's on us! We failed to include them on the journey. A real estate or sales professional that can only point out granite countertops is like a car dealer who can only tell you "The car is red." Price per square foot is an erroneous means of calculating value in new construction. So change the equation! Provide the tools that will help Realtors and Builder Sales Teams demonstrate the value and benefits of high performance homes. Both you and the house will increase in value!

Suggested Presenter(s): Todd Gamboa, Building Trust LLC

### **How HERS Raters (and their data) Can Drive Higher Home Valuations and Builder Satisfaction**

National and state efforts to “green” MLS directories are ramping up and HERS rating companies – and the data they collect – are seen as one of the most valuable and informative sources of energy efficient and high performance home data in the marketplace. Real estate agent, Appraiser, and Lender education on the benefits of high performance homes, along with effectively integrating HERS data into home buying and selling transactions, can influence higher sales prices resulting in greater market value and increased return on investment for homeowners and builders. HERS raters and other contractors helping to make homes better will see their businesses grow by producing a trusted quality product. Attend this session to hear from a panel of national leaders seeking to promote the added value of HERS-rated and certified homes through stakeholder education, data sharing and auto-population, proper appraisal valuation and more. This session will be facilitated from the perspective of “what can I do to make this happen in my market”, so come prepared to learn how you, your company and its local partners can work together to implement and benefit from “green” features in your local MLS directories. NOTE: Ryan Miller to facilitate this session.

Suggested Presenter(s): Michelle Foster, Home Innovation Research Labs; Bob Burns, Pivotal Energy Solutions; Sandra Adomatis, Adomatis Appraisal Service & Amanda Stinton, National Association of REALTORS

### **The “NEW” AI Residential Green and Energy Efficient Addendum - Auto Populate it with HERS**

The Appraisal Institute’s Residential Green and Energy Efficient Addendum has been updated and mapped to MISMO and RESO. If those acronyms are unfamiliar to you, come to our session and you’ll see how important they are to your profession and ours. We’ll show you some examples of a completed Addendum and how it plays important roles in the appraisal/lending process. HERS Index Reports hold the “BIG DATA” appraisers rarely see and often miss in valuing high performance homes. It’s easy to complete the Addendum if the report is available. Raters are the ideal person to complete the Addendum and educate your client on how important the HERS Report and Addendum are in the appraisal and listing process. Connecting the dots from HERS Reports to Green Fields will give you invaluable ways to sell the importance of your services to real estate agents. We’ll show you how the connection from the MLS being populated accurately connects to the appraisal and may even influence the sales price. It is a win-win for everyone.

Suggested Presenter(s): James L. (Jim) Murrett, MAI, SRA, Appraisal Institute & Sandra K. (Sandy) Adomatis, SRA, LEED Green Associ, Adomatis Appraisal Service

### **How Energy Raters Survive (HERS) in the Real Estate Transaction**

How does the HERS Rater survive in today’s real estate market? How do you make the HERS Index a household word? How do HERS Raters gain credibility with appraisers, lenders, sales agents and the public? What is the value of a HERS Index in a transaction? It is certain you cannot continue to be anonymous if you want to be relevant in today’s competitive market.

Just like automated valuation models are crowding the space appraisers once held firmly, computer modeling of energy is moving into your arena as well. We'll give you some pointers on how we see your work product becoming more recognized in the valuation, marketing and financing of homes. Our professions can benefit from working together to provide real estate stakeholders more credible work products to make more informed decisions in a transaction. Let's discuss ways we can both move the needle in making HERS a report homeowners seek and appraisers value.

Suggested Presenter(s): James L. (Jim) Murrett, MAI, SRA, Appraisal Institute & Sandra K. (Sandy) Adomatis, SRA, LEED Green Associ, Adomatis Appraisal Service

### **It doesn't take a Village-It takes an Architect, Contractor, Realtor and Appraiser**

It doesn't take a village-It takes an Architect, Contractor, Realtor and Appraiser To achieve success in designing, building, selling and understanding the value of high performance homes it takes a team working together to accomplish this goal. If all the horses pull together you make great progress. If the parties work at cross-purposes you stand still.

Using real examples of actual builders working together with architects, realtors and appraisers we will learn from a "boots on the ground" perspective on how they are doing it successfully every day. What did they have to learn to make it happen? What are their successful methods to getting consistent results? How much extra profit do they generate by building above code? What role does the HERS rater play and how important are they to the result? How do you sell high performance? Why you can't blame the appraiser?

These questions and more will be answered in this interactive class along with the underlying emphasis on how value and appraisals are truly aligned. The analysis of hundreds of homes from small multi-family to enormous mansions are in the mix along with small boutique to huge production builders.

Suggested Presenter(s): William Janhonen, WSJ Enterprises

### **RESNET's Appraiser Dashboard Enhances Appraisal Data**

RESNET has made a huge improvement to the appraiser's search of HERS Ratings by developing an Appraiser's Dashboard. The Appraiser Dashboard will give them searchable fields to produce more meaningful trends in appraisal reports. HERS is not just a number any longer and understanding the market share of new construction with HERS Ratings speaks volumes to how important energy efficiency is to a market. The updated AI Residential Green and Energy Efficient Addendum has been mapped to the MLS dictionary, RESO and to the mortgage industries' dictionary, MISMO. What does that mean to HERS and the future of your profession? This session will give you an overview of the meaning of these two advancements and how the secondary mortgage market guidelines have changed in regards to energy efficiency.

We'll end this session with a few quick rater/appraiser stories that will bring out ways to improve the relationship and importance of HERS Ratings in appraisals.

Suggested Presenter(s): Sandra K. (Sandy) Adomatis, Adomatis Appraisal Service

### **Water Efficiency Rating Index**

#### **Let's energy rate all new houses! Here's how.**

Requiring all new homes to be energy rated should not be hard if there is buy-in from builders, HVAC contractors, real estate agents, appraisers, code officials, mortgage lenders, mortgage insurers, and the public. Duh! But how do you get that buy-in? It is next to impossible in most states, but starting at the local level and working up is doable. This session is about how you can do it and what it takes.

Suggested Presenter(s): Ron, HERS, Inc.

#### **Mythbusting Water Heating Opportunities**

Heat Pump Water Heaters or Tankless Gas Units? What the heck are these CO2 water heating units? Do I need to do structured plumbing layouts if I have WaterSense fixtures? The water heating landscape is ever evolving with new products and new tools arriving to help us quantify benefits. The problem is that we all have some pre-conceived notions about what does and does not make a large difference. A particular lense will be to consider the impact in modeling for both HERS Index and the forthcoming Water Rating Index. This session will address common misconceptions about HPWHs, On Demand recirc systems, routine maintenance, plumbing design, and more.

Suggested Presenter(s): Dan Wildenhaus, CLEAResult

#### **Is RESNET in Hot Water?**

RESNET claimed that the new software entries for How Water Distribution Efficiency would offset the HERS Index increases of the ANSI RESNET/ICC 301-2014 standard change. Did they? No. To ensure the above conclusion is correct, let's begin by reviewing the entries so we can rule out user input issues. Next let's delve into data used to justify the inclusion of hot water in the HERS Index calculation. Lastly, let's discuss how to affect change.

Suggested Presenter(s): Robby Schwarz, EnergyLogic & Ben Graham, EnergyLogic

#### **Introducing the Water Rating Index**

RESNET is developing an ANSI standard called the Water Rating Index, based on its WER Index guidelines. This session will provide an overview of the draft standard and the development process. Water ratings present a new opportunity for HERS Raters to expand their service

offerings to builders and homeowners. There will be plenty of time for feedback and Q&A, so come prepared to participate!

Suggested Presenter(s): Jonah Schein, EPA & Ryan Meres, RESNET

### **Training Raters for Water Efficiency Ratings**

The RESNET Water Efficiency Rating Index was recently completed. The WER Index provides a comprehensive water efficiency rating for a home, similar to what a HERS Rating does for energy. Water ratings present a new opportunity for Raters to expand the services they offer to builders and homeowners. Come to this session to learn how to conduct a WER Index rating and inspection and hear from a rater that participated in a trial test of the WER Index.

Suggested Presenter(s): Dave Bell, TopBuild; Jonah Schein, EPA & Jacob Atalla, KB Home

### **RESNET Instructor Roundtable- WER Index Training**

Attend the RESNET Instructor Roundtable to fulfill RESNET Instructors' annual roundtable requirement and learn about the training protocols for the new WER Index.

Suggested Presenter(s): Dave Bell, Top Build & John Gillett, Energy Inspectors

### **WATER EFFICIENCY IDEAS: USING NEW WATER TECHNOLOGIES TO REDUCE HOME WATER USAGE, INCLUDING LANDSCAPE, LAWN IRRIGATION, SHOWERS AND THEIR GRAY WATER, AND SENSORS FOR BROKEN PIPES.**

This session will focus on existing and new water technologies both inside and outside for increasing water efficiency.

Suggested Presenter(s): RESNET Staff

### **Water Efficiency Rating Index Pilot Projects**

After a public review and comment process the RESNET Board has adopted guidelines for the RESNET Water Efficiency Rating Index... Prior to the national roll out of the program RESNET will be undertaking a pilot project in seven housing markets in the states of California, Colorado, Florida, Nevada and Texas. This session will explain the pilot projects and share the lessons learned.

Suggested Presenter(s): Jacob Atalla, KB Home; John Gillette, Energy Inspectors & Dave Bell, Top Build