2019 RESNET Building Performance Conference Prospective Breakout Sessions

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Energy Policy and Programs that will Affect our Industry

EPP-1 Successful Strategies and Lessons Learned for Utility Energy Efficiency Programs*
Utility energy efficiency programs are constantly challenged by code revisions, the extent of local enforcement, RESNET interpretations, annual Technical Resource Manual updates, and software modifications. This presentation discusses successful strategies and lessons learned for new construction utility programs to mitigate risk and deliver program objectives. Strategies discussed include predictive analytics, workflow automation, quality assurance tracking, and hybrid incentive structures. This presentation also discusses the impact of successful program strategies and lessons learned from one of the largest and longest running new construction utility incentive programs to aid future utility programs and help RESNET professionals navigate shared challenges.

Presenter: Ian Metzger, Lockheed Martin Energy

EPP-2 Meet and Greet: Get to Know Your Friendly Regional Energy Efficiency Organization (REEO)
You've probably seen us around, but do you really know who the REEOs are and what we do? Hint: if it has to do with energy efficiency, we're probably touching it! Come to this session to learn more about how code adoptions work (or don't work) in your state, the future of utility energy efficiency programs and resources available from DOE. Find out how you can get involved to ensure decision makers in your state are supporting energy efficiency.

Presenters: Lauren Westmoreland, SEEA; Jim Meyers, SWEEP; Richard Morgan, SPEER; Darren Port, NEEP

EPP-3 What We Do with Data in the Dark: Using Data to Transform the Market for New High-Performance Homes
How do we know when programs designed to transform the new home construction market have achieved their goals? The Northwest Energy Efficiency Alliance (NEEA) Efficient Home Initiative in the Pacific Northwest has been collecting data since its inception in 2004. In this session, representatives from the program will discuss how the program data that has been collected is being used to support regional goals. From one angle, the program supports best practices and trains stakeholders across the region on how best to achieve energy savings. We'll discuss how that support can influence code advancement. From another angle, the program works with Home Certification Providers, and uses heat maps to determine how many stakeholders are engaged and where there are opportunities for growth. The program's software platform provider will discuss integration with industry data collectors, such as the Multiple Listing Services (MLS). NEEA will also explain how each facet of the program influences planning region wide.

Presenters: Dan Wildenhaus, BetterBuiltNW; Emily Kemper, BetterBuiltNW; Jon Belmont, Northwest Energy Efficiency Alliance; Bob Burns, Pivotal Energy Solutions

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EPP-4 Debunking the Myths: Why Decarbonization Does Makes Sense in Residential New Construction

Residential builders and developers have traditionally assumed that on-site gas appliances are the most energy efficient options available. This session will explore why, as more renewables come online, this idea no longer holds true, and will explore the role of an all-electric option for the decarbonization of residential buildings through residential new construction programs. This interactive, discussion-driven presentation will explain why in most regions of the country it is not only more efficient, but also healthier, safer, and more environmentally friendly to electrify residential new construction.

Drawing from experience designing and implementing a first of its kind residential new construction electrification program in Sacramento, California, the speaker will address how programs can mitigate specific obstacles and objections facing all-electric new construction. Additional insights include how the sponsor utility is valuing these all-electric homes, and the conversion of avoided therms into kWh savings using a source carbon equivalency.
The session will identify builder, utility, owner, occupant, and environmental benefits of electrification, drawing from review, real life case studies, and cost-effectiveness analysis.

Presenter: Nic Dunfee, TRC Energy Services

EPP-5 From Zero Energy to Zero Emissions: The Transition to Carbon as an Efficiency Metric

As California is reaching both its statewide carbon reduction, and 2020 residential new construction zero net energy goal, we are realizing that our work has only begun. Recent updates to the state's carbon emissions goals call for another 40 percent reduction in carbon emissions by 2030. Within the building sector, this has led to more focus on zero emissions buildings and less on zero net energy (ZNE) buildings. This panel will explore why ZNE goals do not necessarily equate to zero emissions buildings, and how this has caused California to start rethinking the way we value building efficiency. Panelists will discuss what resulted from California's final push towards 2020 goals, and how the state is shifting to the new 2030 carbon emission goals. Attendees will learn why carbon may be displacing energy use as the new metric of choice for efficiency.

Presenters: Nic Dunfee, TRC Energy Services; Martha Brook, California Energy Commission; Pierrre Delforge, Natural Resources Defense Council; Michelle Thomas, Southern California Edison

EPP-6 US Housing Market – The Good, the Bad, the Ugly

The HERS Industry is heavily dependent on the housing market. There are bullish signs for the market – relative low mortgage interest rates, low unemployment rate and pent up demand for housing. There are also dark bearish clouds – shortage of construction labor, uncertain supply costs caused by trade disputes, many recent graduates with crippling high student debt. This session will try to make sense in these uncertain times. The session will feature a representative

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of the leading national production builders, a large HERS Rating company and the appraisal industry.

Presenters: Clayton Traylor, Leading Builders of America; Matt Cooper, PEG; Jim Amorin, Appraisal Institute

EPP-7 Advanced Energy Rebuild: A Disaster Brings Together Otherwise Unlikely Partners
In October of 2017, wildfires ravaged northern California, destroying over 200,000 acres and over 8,000 structures. The fires were especially damaging in Sonoma and Mendocino counties, particularly around the city of Santa Rosa. With so many homes destroyed, the area has witnessed an all-out community effort to help the community rebuild. The utility providers in the area joined the cause, with Pacific Gas and Electric (PG&E), California's largest investor owned utility and natural gas provider to the area, structuring a program to enhance the incentives already available through their long-running residential new construction offering. At the same time, Sonoma Clean Power (SCP)—a local and relatively young community choice aggregator and electricity provider—developed a new construction program for the effected home owners.

When program implementors first attempted to combine these efforts, the contrasting goals and objectives of the two very different organizations became evident; SCP was prioritizing all-electric homes, while PG&E was only permitted to incentive homes according to overall performance with no preference for fuel source. Through compromise and creative thinking, both organizations combined efforts, procured additional funding, and designed a program to provide up to $17,500 to home owners rebuilding more efficient, above-code homes.

This session will focus on how the program design both addresses utility goals while providing much needed assistance to homeowners. We will discuss how this unique, residential new construction program positions homeowners instead of builders and developers as participants, and how this change impacts marketing and outreach, budgeting, and implementation approaches.

Presenters: Nic Dunfee, TRC Energy Services

EPP-8 HERS Rater's Role with Passive House*

Passive building comprises a set of design principles used to attain a quantifiable and rigorous level of energy efficiency within a specific quantifiable comfort level. "Maximize your gains, minimize your losses," summarizes the approach. To that end, a passive building is designed and built in accordance with these five building-science principles:

- Employs continuous insulation throughout its entire envelope without any thermal bridging.
- The building envelope is extremely airtight, preventing infiltration of outside air and loss of conditioned air.
- Employs high-performance windows (typically triple-paned) and doors.

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- Uses some form of balanced heat- and moisture-recovery ventilation and a minimal space conditioning system.
- Solar gain is managed to exploit the sun's energy for heating purposes in the heating season and to minimize overheating during the cooling season.

Across the nation more and more are being built to the Passive House principles. This session will review this movement and explore what opportunities it presents to HERS Raters.

Presenters: Representative of Passive House Institute, Passive House Institute; Chris McTaggart, the BER

EPP-9 California Dreamin' – Path to Net Zero Energy Homes – California Zero-Net-Electricity New Homes Energy Code*

The California Energy Commission updated its building energy code to increase energy efficiency, clear the way for clean energy heating and hot water, and, for the first time, require new homes to install rooftop solar panels. The standards, effective in January 2020, will be a big step forward for energy savings and reducing the carbon footprint of California's homes and buildings—the second-largest source of greenhouse gas emissions in the state. Under the new code, new buildings will be efficient enough that their electricity use can be offset by a modest number of solar panels. Consequently, for the first time, building energy standards will take on another role: in 2020 they will require that rooftop solar panels be installed on new single-family homes and low-rise multi-family buildings to offset the home's expected annual electricity use and achieve "zero-net electricity" status.

This session will explain the new code, why it was adopted and the implications for the rest of the nation.

Presenters: Martha Brook, California Energy Commission; David Goldstein, NRDC; Jacob Atalla, KB Home

EPP-10 Navigating the Rapids: Steering New Homes Programs Through Energy Code Changes

Energy code changes can pose major challenges for new construction programs, but if navigated correctly, can be a land of new opportunities. Come learn about the challenges of diminishing savings, the necessary course corrections to eligibility criteria, and the importance of how, where, & when to set the baseline. Real-world experience from Pennsylvania (moving to 2015 IECC this fall) will be shared. Presenters will also discuss how the mandatory diagnostic testing associated with more recent codes can represent a hidden treasure that can lure new builders into program participation.

Presenters: Kathy Greely, Performance Systems Development; Mike Turns, Performance Systems Development; Third Presenter, TBD

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EPP-11 The Sun Shines Bright on California: New Solar Requirements in the Golden State*

To help meet aggressive decarbonization policy goals, California is going all-in with residential solar. For the first time anywhere in the country, the state's 2019 Title 24 Energy Code will require that all new residential buildings under four stories install solar photovoltaics. This presentation will inform attendees about the genesis, definitions, exceptions, and compliance calculations of this code requirement, and also review the systemic grid and industry challenges on the horizon for implementing it. Presenters will dive into specifics of the code requirement's cost-effectiveness and how it relates to zero-net energy intentions. We will also discuss how well the market is prepared to ramp up residential solar installations from around 15,000 per year to over 100,000. Finally, the presentation will discuss near-future impacts of this infusion of solar energy into the electric grid, from duck-curve mitigation, to impacts on utility rates, to tie-ins with a budding energy storage market. Attendees will come away with a better understanding of California's bold and sweeping advancements in residential solar energy.

Presenters: Matthew Christie, TRC Energy Service; Ritesh Nayyar, TRC Energy Services

EPP-12 A National Retrofit Challenge to Meet the Paris Goal of 1.5 Degrees*

The United States is one of 190 nations that is committed to pursuing efforts to limit temperature increase to 1.5 degrees C above pre-industrial levels. Even back-of-the-envelope analysis shows that this goal will be impossible to achieve without deep retrofits of almost all buildings. This session will explore how this might be accomplished, exploring several options, given that such a program has never been undertaken at this scale before and inherently requires multiple and simultaneous plans and actions by a wide range of stakeholders.

There is a need to take a "whole building" approach to retrofits rather than more common approaches today which emphasize specific widgets or systems. It also emphasizes the need for new methods of approaching building valuation since energy cost savings alone often will not cover the entire cost of renovations. We consider the need for technical innovation in building construction methods and for electric technologies for supplying heat and hot water to buildings. Finally, we consider the impact of deep retrofits on all buildings to the electricity grid as well as the natural gas system.

This session will explore pathways to accomplish this goal with the minimal practical cost disruption and transfer payments from program administrators to property owners. The scale of this endeavor- very roughly $3-$4 trillion- would strain the budgets of current and prospective administrators. The session will introduce a set of paths that, if rapidly implemented, could set us on a practical rather than political approach to meeting the Paris accord.

Presenters: David Goldstein, NRDC

EPP-13 Save More, Get More: Utility Sponsored Programs and Incentive Design

Energy efficiency incentives and their outcomes don't always line up perfectly. Whether it's the misalignment of desired energy savings versus demand savings or difficulty balancing

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performance across different fuel-types, pay-for-performance incentive structures provide solutions that give utilities the ability to fine tune their program participants' behaviors.

Join this session for insight into effective pay-for-performance programs from the rater and utility-sponsor perspective.

Presenters: Kevin Reza, ICF

EPP-14 Moving Towards the Integrated Home – Connected, Interactive, Interoperable, AND Efficient

Program administrators are increasingly addressing grid balancing and consumer engagement among their portfolio objectives; overarching utility business model goals are evolving to focus more on comprehensive, integrated demand-side management (IDSM). Following a similar paradigm shift, new home programs in particular are looking beyond just the asset-based performance of a house to also consider the temporal and locational value of efficiency and non-energy benefits that can be enabled by two-way communication functionality. This concept of an integrated home is one that is both grid-interactive and efficient; connected technologies within the home have the potential to optimize energy management through individual products and systems that leverage interoperability and interactive effects.

The session will provide an overview of the changing landscape of new home programs and how the 'utility of the future' mindset is impacting the design and deployment of new construction efforts. Panelists will share how they are structuring offerings to achieve objectives beyond traditional energy efficiency, such as load management and behavior change.

Presenters: Alice Rosenberg, Consortium for Energy Efficiency; Tim Carter, Alabama Power; TBD, California Utility, Likely SCE or PG&E; TBD, Northeast Utility, Likely Eversource, National Grid, or Efficiency Vermont

EPP-15 In the Age of Trump – The Results of the 2018 Congressional Election and What it Means for the Building Performance Industry

The 2018 US Congressional Election will profoundly alter Congress' complexion no matter which party controls the House and Senate. There have been over 25 Congressmen who decided not to seek reelection. This includes House Speaker Paul Ryan and senior members of key committees. This session will present the results of the 2018 election, introduce the new key faces in Congress and explore the implications for building energy efficiency.

Presenters: Steve Baden, RESNET; Carl Chidlow, Winning Strategies Washington

EPP-16 Value Engineering Shouldn't Be a Dirty Word!

Every builder, tradesperson, and rater have experienced projects with tight budgets or cost overruns. Our wants and needs are not always aligned with available budgets. To make the project viable, we often look to value engineering as a solution. Unfortunately, value engineering

has come to mean a focus on cost cutting. What if we could instead value engineer by giving careful consideration for multiple options, with the project's end goals firmly guiding our decisions. Dan and Nihit will work through examples illustrating how value engineering, conscientious design, and purposeful planning can shift the perception of our wants to enable us to reduce the cost of our needs. They will consider questions like: If we invest more in the envelope, can we really see enough savings in smaller HVAC systems to offset the costs? This interactive presentation will use examples from legendary thinkers, such as Amory Lovins, as well as real world examples of construction projects and measure mixes. Dan and Nihit will then lead a value engineering discussion based on a topic from the audience to engage attendees in this key concept behind becoming a valued project consultant.

Presenter(s): Dan Wildenhaus, BetterBuiltNW; Nihit Shah, TRC

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Home Energy Ratings - Practices and Procedures

HERS-1 ANSI 301 & 380-2019 Standards: What changed and when does it affect you?
Both the ANSI/RESNET/ICC Standards 301 and 380 were updated to their 2019 versions. Come learn what changes were made and how they will impact how you calculate an Energy Rating Index (ERI) and how you conduct performance tests, such as blower doors, duct blasters, and ventilation airflow. Additionally, learn how soon they will impact how you do RESNET HERS Ratings and additionally, if/when they may impact code compliance in your state.

Presenters: Gayathri Vijayakumar, Steven Winter Associates

HERS-2 ANSI/RESNET/ICC 380 in Practice - It's in the bag?!
On a quest to make 380 compliant testing practical and inexpensive, a team of four RESNET QAD's at Performance Systems Development spent a day in the field creating and testing 4 different bag inflation devices. Our results were surprising. Come to this session to hear about our expereince and results including a discussion of ANSI/RESNET/ICC 380 in practice for volume, infiltration, and flow measurements.

Presenters: Emelie Cuppernell, Performance Systems Development; Ethan MacCormick, Performance Systems Development

HERS-3 Forum for Raters and Providers to Promote the Value of Their Role in the Standards Amendment Public Comment process
Forum to promote the value of their role in the Standards Amendment Public Comment process. Learn how as a rater you have a part in the diplomatic process of how standards that affect the Rater industry get approved.

Presenters: Rick Dixon, RESNET

HERS-4 380-2016 Standard and Changes made for 2019*
Standard ANSI/RESNET/ICC 380-2016 has been required for all ratings permitted since July 1, 2018. This session will review key components of the 2016 standard as well as present the changes approved for the 2019 version. Come learn about the specific changes, how they may impact your ratings, and the transition timeframe.

Presenter(s): Iain Walker, LBNL

HERS- 5 Changes to the ERI Standard: Presenting the 2019 edition of ANSI/RESNET/ICC 301-2014
RESNET's Standards are under continuous maintenance. Periodically, the standards are updated to integrate approved addenda and additional revisions into a new edition. By the time of the conference, RESNET will have approved the 2019 edition of Standard ANSI/RESNET/ICC 301-

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2014. The 2019 edition has integrated approved addenda and interpretations from 301-2014 and incorporated many changes to better address multifamily buildings. The biggest change will be an expansion of scope that permits energy ratings to be conducted on any dwelling or sleeping unit, in Residential Buildings and Commercial Buildings (as defined by the IECC), regardless of building height. Come learn about the specific changes, how they may impact your ratings, and the transition timeframe.

Presenter: Gayathri Vijayakumar, Steven Winter Associates, Inc.

HERS-6 Duct Testing, Exempt or not Exempt?*
With various rules for duct testing existing in the market, it can be hard to sort out when and where a duct leakage test must be performed.The duct leakage to outside test is a minimum rated feature required for a confirmed HERS Rating unless a home meets the RESNET duct test exemption. However, if a rating is performed for code, and the code language indicats duct testing is exempt, is it exempt for a rating even if it does not meet the RESNET exemption? What takes precedence?
In this session we will discuss how duct testing is interpreted by various raters, programs, and codes in the Northeast, and what clarity may be needed in the industry going forward.

Presenters: Emelie Cuppernell, Performance Systems Development; Ethan MacCormick, Performance Systems Development

HERS-7 Who We Are – A Town Meeting with RESNET Staff
With the growth of the rating industry, the RESNET staff has expanded. The number of RESNET staff has doubled since the 2017 RESNET Conference. This session will provide an opportunity for attendees to connect with RESNET staff and understand that each staff member contributes. The session will allow participants to enter into a dialogue with the RESNET Team.

Presenters: RESNET Staff

HERS-8 How the Sausage is Made: The RESNET Standards Development Process*
Have you ever wondered if your comments on any of the draft standards are actually considered? Have you ever wondered how to comment on a part of the standard that isn't open for public comment? Have you ever come across equipment or building systems that don't seem to be addressed anywhere in the RESNET standards? Have you ever disagreed with how the standards handle a certain scenario? Have you ever wondered how RESNET's standards are developed? This session will address the step-by-step processes of standards development, with a focus on how you can get involved. It will also describe how you can keep track of what's currently in effect and what's coming soon.

Presenters: Rick Dixon, RESNET; Thiel Butner, Pando Alliance

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HERS-9 Inspecting Insulation and all Minimum Rated Features According to ANSI 301-2019

Are you a HERS Rater who performs field inspections? Are you a Provider who determines field inspection processes? Are you a program administrator who wants to better understand the changing field inspection requirements? RESNET's requirements for inspecting Minimum Rated Features and grading insulation have recently moved from RESNET's proprietary standards to ANSI 301-2019, in Appendix A and Appendix B. Come learn what's changed, what's stayed the same, and how to quickly navigate and understand the new standards language.

Presenters: Thiel Butner, Pando Alliance, LLC; Kelly Parker, Guaranteed Watt Savers

HERS-10 With 13,000 Home Performance Reports, We Must be Doing Something Right

We'll show you strategies for bringing together your utilities, builder community and raters to grow recognition of green building techniques generally and more specifically, to promote the HERS Rating. In this session, we'll talk about a program in which the utilities help the raters and the builders association highlights energy efficient building techniques by promotion of the HERS index through its home tours and their related publications, website, marketing and social media. While you may not be able to replicate the entire program, we believe there are segments that you can apply in your markets. We'll show you how to leverage the connections of your local or state association to continue elevating energy-efficient building.

Presenters: Tom Gavaras, BATC-Housing First Minnesota; Ross Anderson, BATC-Housing First Minnesota;

HERS-11 Equipment Calibration, Field Checks, and Checking in on RESNET 380

This session will explain the manufacturer calibration process, requirements, and how it relates to accurate measurements. We will cover different procedures to ensure your understanding of what must be completed and when, as well as good QA procedures for field checking your equipment. We'll 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. This session will also discuss best practices for conducting diagnostic tests that meet RESNET 380, including a discussion on apps developed by blower door and duct tester manufacturers. This will be a great opportunity to get answers to questions you have from an equipment manufacturer and a HERS Provider regarding the 380 Standard and maintaining your equipment.

Presenters: Sam Myers, Retrotec; Jeffrey Sauls, Energy Vanguard

HERS-12 How Communication can Make or Break a Field Professional's Ability to Affect Change in the Market

Effective communication is essential to a verifier or consultant's ability to affect change in building practices. From responding to push-back when an assembly fails to meet a standard or best-practices to translating a mis-used term, the way we speak and respond on site has as much

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impact on our effectiveness as the depth of our knowledge. Drawing from years of field experience in varied markets, presenters will explore the ability of effective communication to help you drive the market and overcome QA obstacles without compromising key ally relationships. Attendees will learn ways to leverage their communication with builders and trades to drive change in the markets they serve.

Presenters: Heidi McCullough, Building Efficiency Resources; Dan Wildenhaus, TRC Solutions

HERS-13 There's an App for That! - Making Life Easier with Tips and Tricks to Use in the Field*

Energy audits and HERS Ratings can be time consuming to conduct, especially if you are trying to diagnose an issue for a building owner or occupant. This session will provide some faster methods and remove some frustration when performing certain tasks in the field whether it is taking measurements, reviewing plans, or setting up your duct testing equipment. Technology has evolved to help the building performance industry by offering more efficient products and methods for measurement and recording data. We'll look at apps, software, and equipment along with some low-tech, low-cost practices that can help you be more productive in the field. We'll even provide instructions for building your own 2-in-1 diagnostic tool that serves as an exhaust fan flow meter and a pressure pan.

Presenters: Sam Myers, Retrotec; Joe Medosch, Hayward Score

HERS-14 Why is HERS so Much More Important to Raters and Builders Today than ever Before?

With increasing rating market options, Raters must realize the value of RESNET HERS. This session will highlight RESNET's Quality Assurance methods and policies, which add value to a home's rating.

Presenters: RESNET Staff, TBD

HERS-15 Getting The Most Out of Your Blower Door System

A blower door system can do much more than tell you how much your building is leaking. It can also help you determine where the leaks are and how severe some leaks are compared to others. There are also cases where you can use your blower door to determine if some ventilation systems are working properly. In this webinar, we'll introduce the blower door and how it works for those who are new to the industry. Then we'll get into some of the methods you can use to make your blower door work harder, impress your clients, and increase the services you offer. This session is great for testers of all skill levels.
Here are some things we'll discuss:

- Intro to Air Tight Assemblies and Blower Door Mechanics
- Zonal Pressure Diagnostics
- Thermal Imaging

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- Smoke Testing
- Ventilation Check
- Additional Applications where a Blower Door is Used

Presenters: Sam Myers, Retrotec

HERS-16 Getting the Most Out of Your Manometer
In building science, a lot of what we measure is invisible. And much of it is related to pressure and flow. Most of us do blower door or duct leakage testing or both, but there are many other important things we can be measuring using our manometers that can help us figure out what is going on in a home. This session will give you an introduction into measuring draft, CAZ depressurization, room pressures, zone pressure diagnostics, pressure pans, static pressures on an air handler and tools for long term data logging of pressures.

Presenters: Paul Morin, The Energy Conservatory

HERS-17 Social Media 101
Session for business owners to master social media, which platforms to use, the best way to reach clients and what contest to post.

Presenters: Peter Troast, Energy Circle, LLC

HERS-18 How a Proposed RESNET Standard Amendment Gets Approved
Similar to our nation's laws, any proposal change to any RESNET standard must go through a detailed transparent consensus-based process involving public review and comments before being adopted. The public plays a vital role in this process. This transparent, consensus-based process remains a mystery to many. This session will walk attendees through the entire process and explain how one can propose a standard amendment and have one's voice heard in the standard amendment process.

Presenter(s): Laurel Elam, RESNET; Rick Dixon, RESNET

HERS-19 Leveling the Playing Field on Rating Large and Small Homes - RESNET Home Size Adjustment Factor for HERS Index Scores
Previously, RESNET's standard resulted in a discrepancy in the calculation of HERS Index Scores between larger and smaller homes that have similar energy efficiency features. Larger homes received lower HERS Index Scores than smaller homes.

To address this discrepancy RESNET adopted a standard amendment, ANSI/RESNET/ICC 301-2014 Addendum E-2018, House Size Index Adjustment Factors (IAF). The standard amendment revises HERS Index Score calculations to address this issue. The amendment establishes a

calculation methodology that compensates for size in order that similarly configured and equipped dwellings of different sizes will have equivalent ratings.

The Addendum went through several cycles of ANSI consensus standard development and public review before its adoption.

Presenters: Philip Fairey, FSEC

HERS-20 Development of New RESNET ANSI Candidate Standard on Rating Sampling*
The RESNET Rating Sampling Standard (Chapter 6 of the National Home Energy Rating Standard) needs an immediate update. The requirements need to be more clear and consistent, and be able to address sampling of multi-family units.

The RESNET Standards Development Committee 900 on Quality Assurance has established a new subcommittee, the Sampling Subcommittee, to take the lead in amending the chapter. The first effort will be to revise Chapter 6. The Sampling Subcommittee will then develop a draft candidate ANSI standard based on the revised Chapter 6. The draft consensus standard would undergo the RESNET ANSI public review and comment process and ultimately be adopted as a consensus American National Standard.

This session will feature the Chairwoman of the subcommittee, Emelie Cuppernell, and the Vice Chairwoman, Thiel Butner.

Presenters: Emelie Cuppernell, Performance Systems Development; Thiel Butner, Pando Alliance

HERS-21 New RESNET HERS Index Marketing Tool Kit for HERS Raters
An important goal for RESNET is to assist HERS Raters in expanding the demand for HERS Ratings. RESNET is undertaking a major marketing campaign aimed at consumers, builders, code officials and real estate professionals to increase the understanding of the benefits of HERS Ratings. In addition, RESNET has develop a number of tools that HERS Raters and their builder clients can market the HERS Index. These marketing tools include:

- A set of infographics that raters can post on their web site and use as handouts at home shows
- A set of videos that raters can post on their web sites and incorporate in their presentations to trade groups
- Free customizable Consumer HERS Index Brochure
- Free customizable HERS Index yard signs

This session will showcase these marketing tools and discuss strategies to apply them effectively.

Presenters: Valerie Briggs, RESNET

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HERS- 22 Enhancing the Consistency of the Calculation of HERS Index Scores – The RESNET Software Consistency Committee
A key to ensuring the quality of HERS Ratings is to enhance the consistency which the various accredited HERS software programs calculate HERS Index Scores. Too often in the past, the same home could receive a different score based upon the software program being used. For the past four years, the RESNET Board has strived to enhance the consistency of the calculation of HERS Index Scores.

A big step has been achieved with the formation of the RESNET Software Consistency Committee. The Committee is formed as part of a mechanism by which RESNET can improve consistency of HERS Index Scores and modeled energy consumption (based on the RESNET/ICC/ANSI Standard 301) among RESNET, accredited HERS Rating Software Tools, and enhance accreditation testing parameters. This is intended to be a continuous, ongoing process aimed at improving consistency.

To guide the efforts of the committee, RESNET will be retaining the Services of an Energy Modeling Director. The RESNET Energy Modeling Director will act as the arbitrator of the Software Consistency Committee, making technical decisions about modeling tests, requirements, and guidelines with the support of other members of the committee. The position will also be the liaison between the SCC and RESNET staff.

Presenters: Cy Kilbourn, RESNET BOD; RESNET Energy Modeling Director, RESNET

HERS-23 How Raters Can Work with Contractors to Achieve Consistent Grade I Installs
Getting Grade I installation with fiberglass and mineral wool batt insulation requires that builders, contractors and HERS raters work collaboratively toward the goal, but sometimes, even with the best intentions, results fall short of that goal. Learn how one insulation contractor is getting Grade I the first time in more than 90 percent of installs and what raters can do to help the contractors they work with achieve the same results.

Presenter: Patrick Kiker, Insulation Contractor

HERS-24 Air Sealing Priorities in New Home Construction
Insulation alone isn't designed to stop air flow. While insulation does reduce air movement through wall cavities to some extent, its purpose is to control the flow of heat, not air. Reducing air leaks through a building's envelope is critical to ensuring energy efficiency, durability and occupant comfort, but with nearly one mile of exterior joints that can leak air in the typical new home, what are the air sealing priority areas and how do you effectively address them? This session will reveal five priority air sealing locations in new homes and review how effectively addressing these areas can contribute to important air-leakage reductions.

Presenter: Charlie Haack, Builder/Insulation Contractor

HERS-25 Learning from Experienced HERS Professionals

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If you're new to the HERS and the ratings industry, then here is your chance to learn from the experience of HERS rating veterans.

This moderated Q&A will include a panel of experienced raters coming together to talk through what is needed to excel in the HERS Rating Industry, with builder relationships, rating techniques, data management, business best practices.

Presenter(s): Allen Hicks, Energy Efficiency Consultants LLC.; Karla Butterfield, Steven Winter Associates & Tony Lisanti, Integral Building & Design

HERS-26 Grow Your Rating Career with Additional Certifications
You know how to perform a HERS Rating--now learn how you can leverage the skills and techniques associated with a HERS rating into additional business and added value for your builder partners.

Come hear representatives from the following organizations provide a brief background about their certification or label, learn what is required to get certified, and what added value these programs can provide to your business and your builder partners.

Presenter(s): Dean Gamble and Zak Shadid, EPA Energy Star; Nick Hurst, EPA Indoor airPLUS; Olga Cano, EPA Water Sense; Jamie Lyons, Joe Nebbia and Sam Rashkin, DOE Zero Energy Ready Home; Asa Foss, US Green Building Council LEED for HOMES; Katrin Klingenberg, Passive House Institute US; Michelle Foster, NGBS Green & Scott Haugen, Environments for Living

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Launching the HERS Rating Industry to a New Trajectory

NEW-1 The Shape of Things to Come – Manufactured Component Home Building and Potential Effects on the HERS Industry
Due to the challenges of labor and product prices there is a possibility of a major disruption in the home building and HERS Rating industries. The shortage of carpenters, framers, roofers and other home building trades and the increases in lumber prices presents challenges to the traditional stick built housing model. This session will explore the potential of this disruption and possible effects on the housing and the rating industries through the perspectives of a product supplier, high volume HERS Rating firm and a national production builder.

Presenters: Clint Shireman, Knauf Insulation; Galo LeBron, Energy Inspectors; CR Herro, Meritage Homes

NEW-2 To Notches Unknown – A Goal 90% of All New Homes Rated by HERS Raters – What Would it Take?
Currently around a quarter of news homes built annually in the U.S. are HERS rated. The RESNET Board of Directors has set a goal of having half of all news homes HERS rated annually. RESNET staff is embarking on a marketing plan to achieve that goal. But, what would it take to achieve the boldest goal – having 90% of news homes inspected, tested and labeled by HERS Raters? This session will explore if this goal is possible, and if so, what it would take to achieve such a goal.

Presenters: John Gillette, Energy Inspectors; Dave Bell, Top Build Home Services; Steve Byers, EnergyLogic; Mary Eipert, Bremen Energy Auditors, LLC

NEW-3 Renovations and Additions: Inside the First Program to Penetrate this Untapped Market with Huge Potential for rRaters and Utilities!
New homes and existing homes get plenty of attention in the form of ratings and utility program incentives, but major renovation projects that also add floor area to the home tend to slip between the cracks. These projects represent a major opportunity to capture energy savings and could be a growth avenue for both utilities and HERS Raters. This session will describe the first 6 months of a cutting-edge program in Massachusetts that aims to light the way for the nation to capture this huge market opportunity. It will include an overview, lessons learned, steps to get involved, and a pattern for other regions to successfully implement similar programs.

Presenters: Cy Kilbourn, Ekotrope; Michael Berry, ICF; Mark Pignatelli, ICF

NEW-4 Achieving the Goal of Having 50% of New Homes HERS Rated – A RESNET Marketing Campaign
The RESNET Board of Directors has set a goal that annually 50% of all new homes' building performance are verified by HERS Raters. To achieve this goal RESNET is undertaking a

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comprehensive marketing campaign aimed at consumers, builders, code officials and real estate professionals. The campaign will have the following elements:

- Research & Analytics
- Audience Targeting & Resource Allocation
- Communication Channels
- Develop Messaging
- Delivery of Campaign
- Evaluation of Results

This session will present the marketing plan and the results of the plan's research. In addition, the ads developed will also be shared.

Presenter(s): Steve Baden, RESNET; Natalie Good, 4D

NEW-5 Rate it AND Certify it

A HERS Score is the gateway to a high performance home, and for raters, it is an opportunity to increase their profits. When your company is hired to provide a HERS Rating, it creates an opportunity for you to educate clients on the value of additional certification programs like ENERGY STAR, NGBS, PassiveHaus and LEED while increasing your earnings. If a HERS Rater can also certify to other energy efficient and green building programs it is more cost-effective for your client, and it increases your efficiency while lining your pockets. But which certification is right for which home? What does that certification offer your customer? Hear from a panel of experts on how to engage and upsell to customers while showcasing the value of certification beyond just a HERS Rating to create a new revenue stream.

Presenter(s): Megan Alise Carroll, NAHB; Abe Kruger, SK Collaborative; Brad Bray, Us Ecoglogic; Matthew Cooper, PEG

NEW-6 How Do YOU Rate?

How important are you at influencing your customer? Product suppliers, trade partners, energy raters, and real estate professionals all believe they are an important part of the final product, but are they? How much influence do you have on your clients, your market, and your industry? Are you leveraging your value to the homebuilder or just providing code compliance ratings? Cost will always be a paramount consideration for builders. Learn to be invaluable by maximizing your effectiveness, improving your sales skills, refining your message, leveraging your building science knowledge, and showing value for your product and services. High performance homes are the future for homebuilding,... are you?

Presenters: Todd Gamboa, Building Trust LLC

NEW-7 Marketing Malarkey

Have you ever wondered what marketing departments do, or where building product information comes from? This session aims to dispel fact from fiction, and rumors from reality in the world

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of building products, as well as equip the audience with the right questions to ask to cut through marketing claims and take away relevant information.

Presenters: Clint Shireman, Knauf Insulation

NEW-8 Adapt and Overcome: Hiring a Young Workforce
Where can you find new employees, and how will you keep them? What are the priorities of the new generation(s) of workers? This session will look at strategies for recruitment and investment of young employees with the goal of making a long-term career out of skilled trades.

Presenters: Clint Shireman, Knauf Insulation

NEW-9 The Complete Business Owner: Why Most "Successful" Small Businesses Will Never Be Successful
It's true that "success" is in the eye of the beholder, but without two key ingredients that should be a part of every business plan, companies, big and small, will never truly be successful. In this presentation, you will learn what these ingredients are and their importance for creating velocity for your company and a team that is more empowered, cohesive, and excited to come to work every day. You will also learn the most important thing you can do so your entire team is clear about where you want to lead them, and the most effective way to focus your team's attention on what you believe is most important for the organization's success and so that everyone is rowing in the same direction. Lastly, with the economy going strong, but lots of signs that an end to the record market expansion may be coming soon, you will learn why the two key ingredients shared in this presentation are so important to your organization thriving rather than just surviving when the economy takes a turn for the worse.

Presenters: Daran Wastchak, Insight Consulting Partners, LLC

NEW-10 Why Being a B-Corp is Beneficial to Your Business and Our Industry
Did you get into the HERS Rating business because it's the quickest path to riches? Probably not, and you're probably like most of us who got here because you value helping a builder build better, more sustainable and energy efficient homes; it gives you energy and the assurance that what you do for a living is having a positive impact on our environment, our communities, and our neighbors. In this presentation, we'll give our insights into how we celebrate our b-corp designation and company mission to recruit and hire the next generation of building scientists, increase our team member engagement, improve our sales and retain more clients, and improve production, quality and by-in from our team members. Being a triple-bottom-line company allows us to be successful in an always-changing, always competitive marketplace. And best of all, it's a lot more enjoyable! What if the HERS industry were full of b-corps, who trusted each other, knowing that we run our businesses on shared values? That we all have the same goals in mind; that we're in it to have a positive impact on our people, our planet, in addition to making a profit. Would we as an industry be facing the same challenges we're facing today? Would we

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have the same quality concerns if HERS raters were hired based on these values, and their leaders ran their businesses on these same values?

Presenters) Daniel Conner, Southern Energy Management; Taylor Fearrington, Southern Energy Management; TBD, SEM or affiliate b-corp;

NEW-11 Lower HERS Index Scores Command Better Sales Price

The North Carolina Building Performance Association (NCBPA)'s 2017 North Carolina Energy Efficient, Green and High Performance Home and Building Inventory Report found an average 9.5% premium for high performance homes sold in three metro markets in North Carolina over a two-year period. The report analyzed 34,152 high performance homes and buildings being built or retrofitted in North Carolina in 2016. NCBPA reports that "working alongside research partner National Association of Home Builders (NAHB), the analysis? The study found that homes with HERS Index Scores between 40 and 89 commanded a price of between $85.89 and $162.52 per square foot. This session will present the results of this ground breaking study and discuss lessons that can be learned for the rest of the country.

Presenters: Ryan Miller, North Carolina Building Performance Association

NEW-12 Getting HERS to Zero: The New RESNET & NBI Zero Energy Certification Program

RESNET and New Buildings Institute (NBI) are launching a new Zero Energy Designed Homes certification program. This certification program will leverage the HERS Index and will provide an exciting new way for our industry to market and promote the leanest, meanest, greenest new homes. Customers will have confidence that they are getting an ultra-high-performance home, builders will have a way to differentiate themselves, utilities will have a way to provide rebates and incentives, and HERS raters will have a new line of work. Come learn about this new, simple, easy-to-navigate program that will help catalyze the market for Zero Energy homes across North America.

Presenter(s): Alexi Miller, PE, New Buildings Institute

NEW-13 Workforce Development Resources for Rating Companies

As the number of HERS Ratings continues to increase nationally, rating companies can benefit from involving themselves in local, state and national programs and resources that aid in the recruitment and retainment of skilled positions in their companies. This session will provide examples of beneficial local, state and national programs that companies can participate in, and describe how individual companies can use these resources to participate in internship, apprenticeship and other programs that support ongoing workforce development.

Presenter(s): Ryan Miller, North Carolina Building Performance Association

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NEW-14 A Case Study of a HERS Rated Active Senior Community – St. George, Utah's SunRiver Development

With the aging of Baby Boomers, there is a growing housing market trend of retirees down sizing their homes and moving to active senior communities. Since these homebuyers are on fixed incomes utility bills and comfort are critical issues. The SunRiver Development in St. George in southern Utah is such a development. SunRiver has a different twist, however. All of the more than 2,000 homes in the development are HERS rated having HERS Index Scoes in the mid 60s. The homes are also water efficient.

This session will feature why the development made the HERS energy performane commitment and the reaction the market had.

Presenters: Kelly Stephens, SunRiver Development

NEW-15 RESNET ELC Introduces New Recruitment Toolkit

The RESNET Emerging Leadership Council (ELC) is committed to recruiting the next generation of leaders for the ratings industry. And that recruitment can start at the local level. The ELC has developed a free recruitment resource toolkit for rating providers to promote energy ratings careers on a local level. While the home building industry labor shortage is a global issue, we can act locally to increase the inclusion of energy raters among possible career choices. Attend this session to see the contents of the toolkit and hear suggestions, talking points and examples of how to recruit new raters at the local level.

Presenters: Valerie Briggs, RESNET, Matt Gingrich, Energy Diagnostics, RESNET VP, ELCChair

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New Technologies and Building Practices that are Changing our Industry

TECH-1 Best Home Building Practices in Wildfire Country
"Don't get burned: The right materials and details are a start. Landscaping and regular maintenance can help. But even these steps sometimes aren't enough. In this special report, contributing writer Scott Gibson takes a look at the devastation left by the 2017 California Wildfires, and addresses whether code requirements saved some dwellings, and whether a review of the building codes is due in the wake of the devastation. He describes the differences between combustible, noncombustible, ignition-resistant, and fire-resistant materials and where they should be used. The article includes an illustration of defensive details to give a home the greatest chance of surviving a wildfire, including recommendations for landscaping, roofs, windows, and doors, and outbuildings."
https://www.finehomebuilding.com/2018/02/27/building-survive-wildfire-country

Presenter: Scott Gibson, TBD

TECH-2 Installed Performance
During this session, we will explain and demonstrate the effects that the duct and duct end terminations have on installed performance. My research indicated the traditional rating of exhaust fans at 0.1" static pressure is questionable. The duct end termination alone can contribute over .2" static pressure. We will present data that was gathered by Daniel Escatel from Texas A&M as his thesis. The data clearly evidences the reality that duct end terminations are a substantial contributor to installed performance. We will also discuss and physically show (hands-on) how duct size configuration can cause the fan to fail performance verification. 4" duct should only be used in certain situations and lower airflows because of the restrictive nature of the duct size. 6" duct is preferred and the performance difference is substantial. Finally I will present the Steven Winters report which shows fan curves and how many fans can fail when faced with static pressure greater than .3". His report makes no reference to manufacturers. The presentation and its data do not make any reccomendations towards any specific supplier. Our intent is to outline what is taking place in the home and for buyers to get what they are paying for.

Presenters: Russell Pope, Panasonic

TECH-3 Mechanical Ventilation 101*
Best practices, regional variations, proper energy modeling, etc.

Presenters: Iain Walker, LBNL

TECH-4 IAQ Basics: Definitions and Testing

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Defining all the things that make up good air and bad air. Defining things that are easy to test and hard to test, e.g. what can I get from a $200 meeter vs a $2000 meter. Things like Radon, mold, VOCs, CO2, CO, NO2, particulates, etc .

Presenters: Bill Spohn, TruTech Tools, LTD; TBD

TECH-5 HVAC 101
What is HVAC and how does it work? The basic basics. Round out your whole house and building science knowledge with a better understanding of how HVAC systems work and effect other areas of the house.
Learning Objectives: Learn key HVAC terminology used in the technical and business areas of HVAC, understand the relationships between HVAC systems and home/building performance, feel more comfortable having a conversations regarding HVAC

Presenters: Bill Spohn, TruTech Tools, LTD

TECH-6 Combustion Testing
Learn the science and methods behind proper combustion and gas leak testing.

Presenters: Bill Spohn, TruTech Tools, LTD

TECH-7 AirFlow 2019
Catch the wind in this comprehensive overview on ways to measure airflow. From basic to refined, see the products and processes, and learn a little about the research that goes into this important subject area. Attendees will get to handle air flow measuring products passed around the room. Learn the science behind airflow measurements and gain a better understanding of how to make a good measurement

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

TECH-8 Incorporating Electric Vehicles into New Home Construction
"The best time to plan for an EV charging station is before someone even knows they want one. Recently, the City and County of Denver joined Boulder County, Colorado and Salt Lake City and many other municipalities across the country and took a small, but important step forward in building a more sustainable energy future by adopting an EV Ready building code. Two other Colorado municipalities, Boulder and Aspen have incorporated electric vehicle friendly building codes into their pending code updates. Incorporating EV Ready language into building codes will save future home and business owners money and headaches when they look to add EV charging. Essentially, EV Ready means that there will be sufficient capacity in the electrical panel for a future Level 2 charging station and that there will be wiring or conduit from the electrical panel to the garage or parking area. This will help to avoid expensive retrofits due to panel upgrades and trenching through yards and parking lots. This session will explore the

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national and local trends regarding EV Ready building codes and provide insight from municipalities on how the codes were adopted and how they're being implemented." https://www.usgbc.org/education/sessions/rocky-mountain-green-2017/how-building-codes-can-support-electric-vehicles-107822

Presenter(s): USGBC Rep, TBD

TECH-9 Tiny Homes and Energy Efficiency
Now that RESNET has a Home Size Adjustment, learn how this effects the emerging Tiny Home market.

Presenter(s): TBD, TBD

TECH-10 The Great Debate on Indoor Air Quality – ASHRAE Standard 62.2 vs International Residential Code*
There is currently a great debate over what should be referred to as the standard to ensure proper indoor air quality.

ASHRAE has adopted an ANSI national consensus standard, ASHREA 62.2. Meanwhile in the International Residential Code, the International Code Council has a different reference to indoor quality. This issue is critical in that the RESNET/ICC/ANSI Standard 301 use the calculation in ASHRAE 62.2 as the reference home to calculate Energy Rating Index Scores. The 2018 International Energy Conservation Code (IECC), however, includes a calculation based on the International Residential Code to Section 406. This means that homes that are HERS rated will have different scores than homes that are calculated to comply with the 2018 IECC Section 406.

This session will explore the differences between ASHRAE 62.2 and the International Residential Code and feature a lively discussion between proponents of each standard.

Presenters: Joe Lstibruek, Building Science Corporation; Iain Walker, Lawrence Berkeley National Laboratory

TECH-11Home Energy Flexibility for the Future*
Builders can offer homeowners increased levels of comfort, convenience, automation, customization, and resilience by including connected devices in new homes, such as smart/connected speakers, thermostats, appliances, HVAC, water heaters, lighting and batteries. Connected devices can also help prepare a home to be a grid-interactive efficient building (GEB), better-controlling when energy is consumed during specific times of the day and days of the year relative to the timing of on-site photovoltaic generation (if present) and the conditions of the electric grid. As utilities install more advanced metering infrastructure (AMI) and offer more residential customers time-based rate programs, homeowners can manage and reduce their utility bill costs through load flexibility and load shifting. This session will present a homebuilder's perspective on the value of including smart and connected devices in new homes, discuss energy

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and cost saving of opportunities grid-interactive efficient homes, and describe ways in which energy modeling tools are being improved to predict the benefits of connected devices and GEB strategies.

Presenters: Ben Polly, NREL; Dave Roberts, NREL; HomeBuilder, TBD

TECH-12 An Interactive and Full Featured HERS Rating of the Future

Futurology - the ability to imagine, anticipate and integrate future technologies. The year is 2029, 10 years from now, 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 "Rating" of a Home, 3D experience without a headset. 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, chemical composition, heat transfer, moisture and air movement can be visualized during this walkthrough. I will guide you through a house built in 2021 that is being evaluated in 2029. 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 - it's 2029! 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 complement or conflict with the occupant's genome. This all comes together in a live performance simulating the "evaluation". As I walk through the house, you the audience will see the views from my "surround cameras", "wrist PC", Augmented Reality and other microdevices that evaluate the conditions in the house, (all simulated). There is a narrator that is explaining the conditions, devices and what current technology this is based on. Join me in the Future!

Presenters: Joe Medosch, Hayward Score

TECH-13 The Indoor Air Quality Score

Which home and equipment upgrades and improvements are most valuable to reducing the risk of an IAQ problem in your home? Berkeley Lab's IAQ score will help you answer that question. The score will quantify the relative merits of features like general ventilation, filtration, humidity control, and using low-emitting building materials. This presentation will provide an update on the score's development and projected rollout.

*Submitted as an ADVANCED session

Presenters: Brett Singer, Lawrence Berkeley National Lab; Iain Walker, Lawrence Berkeley National Lab;

TECH-14 What the Duck? Helping Builders Design and Sell Good Grid Citizenship
The construction industry has long focused on energy efficiency and renewables as a way to differentiate buildings, reduce operating expenses and provide a number of non-energy benefits to consumers. However, due to a variety of source energy and site usage trends, the need to shift loads and flatten load curves has become a real and pressing issue for utilities and municipalities: enter the Duck Curve.

This session will look at how the imbalance between renewable production and peak demand may impact utility program design, incentives, and product offerings. We will also discuss the split in who is bringing Distributed Energy Resources (DERs) to the table – new construction market actors or utilities. We will explore some basic questions, including:

- How can the residential construction industry position itself as an essential utility and market partner?
- How can we pass along or sell these benefits to homeowners?
- Which products and processes provide both value and demand response opportunities to homeowners?
- What are the challenges associated with designing and installing rooftop solar and DER systems?

Presenters: Dan Wildenhaus, TRC

TECH-15 How to Use Consumer IAQ Monitors to Create a Healthier Home
For less than $200, you can buy an indoor quality monitor that measures temperature, relative humidity and particulate matter, and for just a bit more you can also get CO2 or VOCs. These devices can interface with smart home systems to activate filtration or ventilation controls. But are the monitors accurate and reliable enough? We will discuss key performance issues and summarize available information from testing done by Berkeley Lab and others. We also will present recommendations on how to select and use these monitors for effective IAQ control.

Presenters: Brett Singer, Lawrence Berkeley National Lab; Iain Walker, Lawrence Berkeley National Lab

TECH-16 Emerging Technology and the Building Industry
As technology continues to push boundaries, it is more important than ever to stay on top of new innovation and how it affects the way we build homes. In this session, we'll take a look at the significance of current and emerging technology taking place both inside, and outside, the building industry. Participation will be encouraged as we spend a significant portion of the session having a conversation about how these advancements are currently being used, or could potentially be used, and how they could change the way we build, live in, and analyze homes.

*Submitted as an ADVANCED session

Presenters: Colby Swanson, Momentum Innovation Group; Steve Byers, EnergyLogic

TECH-17 Five Priority Air Sealing Locations for New Homes*
Certified RESNET HERS Raters play a central role in helping builders transition to new, more stringent residential building energy code requirements, like the 2012 or 2015 International Energy Conservation Code (IECC), which require blower door testing. Some builders have reported difficulty meeting new air tightness requirements such as 3 ACH50. Proper air sealing is critical to meeting these new air tightness targets and there are strategic locations that should be a focus for builders. The Insulation Institute has conducted research to quantify significant air leakage from five specific locations and estimated their potential contribution to ACH50 reductions. This session will present the findings of the Insulation Institute research. Learn where these five locations are and how raters can help builders target these locations to boost air tightness levels.

Presenters: Charlie Haack, NAIMA/Insulation Institute

TECH-18 Jenna and Mike on Ventilation - Part Deux: Emerging "Smart" Ventilation Strategies and ASHRAE 62.2-2016
After reviewing the basics of ventilation and how the codes and standards fit in, this session will explore emerging technologies in smart whole-house ventilation. Smart ventilation systems could reach maximum potential in hot and mixed-humid climate zones and help lessen industry push-back on fresh-air and tight building requirements. Presenters will dive into actual Building America research findings in order to analyze predicted benefits, such as increased energy savings and indoor air quality, when compared to a baseline, continuous ventilation strategy. Additionally, presenters will demonstrate ASHRAE 62.2-2016 Relative Exposure calculations and how these calculations compare to real-world data. Come learn what we've learned!

Presenters: Jenna Grygier, Southface; Mike Barcik, Southface;

TECH-19 Ventilation and Dehumidification Geeks - Thermodynamics Always Wins*
Mechanical ventilation is the only reliable means to insure adequate fresh air moves through a house to dilute the pollutants. The ASHRAE 62.2 Standard prescribes the amount of air movement required, but it does not prescribe what system should be used to accomplish that flow. Even though the Standard is based on the best available information about indoor air pollutants, it does not explicitly address the impact on moisture, radon, carbon monoxide, or other pollutants or the cash cost of ventilation. And depending on the local climate and ventilation strategy, it's possible to encounter serious issues with excessive moisture and mold if humidity is not accounted for in the design. In this session, you'll hear from a long-standing member of the ASHRAE 62.2 Committee about the various approaches to mechanical ventilation (e.g. exhaust-only, supply-only, and balanced) and the pluses and minuses of their impact on fresh air and pollutants in homes. This discussion will be enhanced by field data from a recent study of homes in Virginia on mold and moisture. Finally, learn how active

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dehumidification might be used to improve both comfort and durability, or as an alternative for crawl space conditioning in climates where high humidity is an issue.

Presenters: Paul H. Raymer, ICF; David Treleven, Thermastor

TECH-20 IAQ, Ventilation, and Airtightness in High Performance New and Existing Homes

Stringent ventilation and airtightness requirements are becoming commonplace in the high performance homes industry, and green building rating systems are starting to encourage and sometimes require aggressive IAQ provisions, including use of low-emitting materials, chemical avoidance, and enhanced air filtration. But do these challenging requirements result in better indoor air quality for home occupants? In this session, learn how air pollutants found in these homes compare with health-relevant guidelines and what factors contribute to IAQ in high performance homes, such as kitchen exhaust fans, commissioning and source control. How important is, occupant education, cooking, or commissioning? This session will answer these questions by presenting summaries of field studies including results from recent field studies of air pollutant levels in high performance homes.

Presenters: Iain Walker, Lawrence Berkeley National Laboratory; Brett SInger, Lawrence Berkeley National Laboratory

TECH-21 Do Sealed and Insulated Attics Save Energy?

Traditionally, attics have been insulated at the flat ceiling with deliberate venting between the attic and outside. It is also increasingly common to place the HVAC system and ductwork in this attic space. This exacerbates the thermal and air leakage losses for the HVAC system. One solution is to seal and insulate the attic at the sloped roof surface, with no insulation between the home and attic. This makes the attic more like conditioned space, so that HVAC losses are minimized. However, this is offset by increased building envelope area and, sometimes, less insulation, leading to increased 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? 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.

Presenters: Iain Walker, Lawrence Berkeley National Laboratory; Brennan Less, Lawrence Berkeley National Laboratory

TECH-22 The Impact of Issues Hiding Behind Drywall

One of the biggest challenges for builders and raters is addressing air infiltration and meeting infiltration requirements. This is increasingly important as code continues to become more stringent and should be addressed as early on as possible during the home construction period.

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While air infiltration is an issue that can be manifested in many different ways, this session will focus on the top causes and common issues as determined by real world data collected on over a thousand QA/QC pre-drywall visits across Maryland, Minnesota, North Carolina, and Ohio. ICF, a leading utility energy efficiency program implementer, conducts and tracks QA/QC results across its programs in Sightline, a proprietary data collection application and database. Using the data collected from the field over the course of the last three years, we are able to identify, examine, and address important trends. The session will also address how these issues lead to builder frustrations and additional issues at final inspection. Finally, this session will discuss proactive strategies to address these common issues. With this session, we hope to increase awareness of the common pitfalls so we can advance the building process and increase the success rate of infiltration testing.

Presenters: Carlos Rivas, ICF International; Ed Abell, ICF International; Stephen Willingmyre, ICF International

TECH-23 Advanced SketchUp for Energy Professionals
SketchUp is a powerful graphic modeling tool developed by Google and now owned by Trimble. EnergyLogic has successfully trained many HERS Raters and other Energy Pro's on using SketchUp to streamline the take-off process. With its 3-D depiction of the thermal envelope, it has also proven to be a strong tool when reviewing probationary ratings, performing quality assurance, and field verifying a house was built to the original model. We will be covering advanced features of SketchUp as well as troubleshooting common problems in advanced models. Whether you're a pro at SketchUp, just learning the tool, or considering a new takeoff process we think you'll find this session useful in your day to day work in SketchUp. Also feel free to check out our pre-conference session to get a full tutorial on using SketchUp for takeoffs.

Presenters: Glenn Pease, EnergyLogic; Ben Graham, EnergyLogic

TECH-24 3 Paths to Residential Fresh Air
Today's tight residential dwellings are great for lower utility bills but are too often problematic for indoor air quality. A wide-range of harmful pollutants can accumulate including mold-causing excess humidity. The good news – there are a variety of ventilation solutions to fit most any situation, climate zone and budget. This webinar will begin with a review of the differences between local room ventilation and whole dwelling continuous ventilation. The focus will then turn to the three basic methods of providing continuous fresh air: exhaust, supply and balanced.

Presenters: Patrick Nielsen, Broan

TECH-25 Connecting Energy Efficiency, Durability, Sustainability and Resilience to Design Building Envelopes
Global climate change has caused increased threat to the built environment by means of flood, tornado, wild fire, extreme temperatures, and increased wind driven rain. Building science solutions to manage the increased threats have a foundation in previous solutions for energy

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efficiency, durability and sustainability. As new building technologies and innovations are incorporated into the building envelope 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 and thermal management to manage the comfort of occupants. This presentation will describe how resiliency connects with energy efficiency and durability. An overview of resilience programs and how buildings are playing a part in them will be provided. The presentation will also 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.

Presenters: Theresa Weston, DuPont Performance Building Solutions; Amy Schmidt, Dow Building Solutions

TECH-26 Midwest Trends: Using Big (HERS) Data to Understand Residential Construction

HERS Ratings are big business in parts of the Midwest and in some states comprise over 60% of all newly constructed homes per year. From 2014-2016, over 23% of newly constructed single-family homes received a HERS Index rating in the 13 state Midwest region. In this session, the Midwest Energy Efficiency Alliance (MEEA) will present findings based on an analysis of all RESNET Certified single-family HERS rated homes in key parts of the Midwest during this three-year period. This dataset of more than 79,000 homes not only includes the HERS Index score, but also the essential field verified home components (minimum rated features) that impact energy use and produce a HERS score. MEEA will utilize this HERS data to provide an overview of construction trends in the Midwest. This analysis will identify key metros for HERS Ratings and what motivating factors may exist, understand the similarities and differences between construction practices from state to state, and explore how home construction with respect to energy features may have changed over the three-year timeframe.

Presenter: Ian Blanding, MEEA

TECH-27 New Roofing Technology-Eliminate Condensation in Optimized HVAC Designs with Radiant Barriers and Buried Ducts in High Performing Attics*

New way of creating a highly insulated attic has been devised. This proposed method deploys a fundamental principles of the new performace attributes of unvented attics with a vapor diffusion port at the ridge of the attic. First of all, the attics are sealed, creating no intentional ventilation with the exterior. This is particularly of value in hot and humid or mixed climate zones where period of the year exist with rather high exterior relative humidities. Making the attics unvented reduces the moisture load during this period and allows the attics to become the driest possible. The sun essentially does all the work resulting in a very dry attic. However, as all the insulation is placed on the bottom of the attic and not touching the exterior sheathing of the attic, there is a risk for vapor from the interior of the building to diffuse to the sheathing. This is particularly important during the cold period season where the absolute water content of the interior is higher than the exterior. Also, the outside temperature of the sheathing board is lower than the dew

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point resulting in possible condensation and localized moisture accumulation. If this persists, the high moisture contents with cause mosture induced damage.

To combat this issue an innovative approach borrowed by Dr. Lstiburek is deployed. A diffusion port (alway vapor diffusion but not air flow passage) along the ridge is used to allow vapor to escape from the attic and dry the roof in the cold periods of the year. This vapor diffusion port is a water vapor pressure release valve that creates passive drying from the interior to the exterior of attic.

The presenters will describe the deployment of this innovative approach to create great performing attics (R-50 to R-70) burying the air tight ducts with an air tight attic floor lid. A combined theoretical analysis with modeling data will be presented along with the measurements of 4 real building attics located in Southern hot and humid USA .

Presenters: Achilles Karagiozis, Owens Corning; Joe Lstiburek, Building Science Corporation

TECH-28 Greenstone Homes Net Zero Demonstration Project and the Lessons Learned*
This presentation will present the Greenstone Homes Net Zero Demonstration project and the lessons learned in moving a production builder to Net Zero Home building practices. Greenstone Homes is the largest home builder in Eastern Washington. In 2017, Greenstone Homes collaborated with Mitsubishi and Lifebreath to do a Net Zero Demonstration home that was certified as a DOE Zero Energy Ready Home with a solar array. Greenstone Homes made simple modifications to a standard home plan and was able to build a Net Zero home for less than 10% cost increase from its standard build. The HVAC strategy for this home utilized ductless heat pumps and a transfer fan along with an HRV. This home also included a whole home filtration system to improve indoor air quality. The home is fully monitored to assess energy, comfort, and IAQ. With the new Net Zero home building requirements in California, projects like this are valuable to show that Net Zero is achievable by production home builders with some simple and affordable modifications to standard building practices.

Presenters: Greg Davenport, Mitusbishi Cooling and Heating

TECH-29 Automated House Sealing - AeroBarrier Envelope Sealing of New Homes
This session will discuss the overall objectives and results of a Building America project focused on integrating a new AeroBarrier 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 sticks to seal 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.

This technology has proven to be incredibly successful, as it typically seals 80% of the sealable leakage within one to two hours of injection. Many homes are being sealed to passive

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house standards. This Building America project has provided significant research needed to successfully integrate aerosol envelope sealing into the home building process. The project team worked 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 sealing houses for builders in California and Minnesota.

Presenters: Dave Bohac, Center for Energy and Environment; Paul Springer, AeroBarrier

TECH-30 Energy Storage for the Home
This session will explore the value of hole energy storage and the options available, now and in the near future.

Presenters: Mike Hopkins, Ice Energy Holdings Inc.

TECH-31 As Solar Becomes more Affordable and Available in Home Marketing, How does that Affect the Housing Industry? What will Change in Products, Storage, and Home Pricing?
This session will detail new products, such as solar materials, inverters, storage options, costs now and anticipated in the net few years.

Presenters: RESNET Staff

TECH-32 Choosing Sustainable Materials: Science for Saving Energy, Water the Environment and Humanity
Demonstrating the relationship between sustainable materials and practices and utilizing ecobuild construction is now just coming into favor among architects, engineers and builders. What is the nexus between sustainable materials and energy, water, health, durability, environment and value? Sustainable materials are more energy efficient, save water, they are healthier for trades and the occupants, have a lower carbon footprint, use less fossil fuel, and provide greater value than less sustainable products. However, is it only the material itself that makes one sustainable product better than another? The discussion will focus on how to select the right material, describe the differences in material and product labeling that define sustainable attributes and demonstrate environmental, natural resource, energy, water and other associated savings. Examples of sustainable materials and manufacturing practices will be discussed as well as presenting resources that support decision making when evaluating cost, value and transparency. If sustainable materials and practices are known to be a positive factor in energy savings, it stands to reason that incorporating sustainable practices would likely lower HERS scores. If in fact, that is the case, should RESNET consider ways to incorporate sustainable attributes into ratings? Something to consider.

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Presenter: Rick Blumenthal, Knauf Insulation

TECH-33 Our Buildings… Our Health
An investigation into the design and construction of air tight, energy efficient, exceptionally comfortable buildings. Every building needs a properly designed and functioning ventilation system. Plentiful fresh clean air at comfortable temperatures needs to be provided to the occupants year round. Infiltrated air cannot be the primary source of make-up air in a high performing building. This is especially true in winter months, when less outdoor air enters the home and the concentrations of contaminants we are exposed to increases. We can choose to design and construct without chemicals that emit volatile organic compounds (VOCs) which are carbon-based chemicals which become gaseous at room temperature. Common VOCs include methane, benzene and methyl chloride. Some are known to cause short- and long-term health effects. VOCs are released from thousands of products, including paints, cleaning supplies, air fresheners, personal care products, and building materials. Along with ventilation, specifying materials and finishes is key to good indoor air quality. While thoughtful design and construction can result in a high performing, comfortable building, that doesn't mean it will. Occupant behavior will affect performance and durability, therefore education is critical so everyone can breathe easy long after occupancy.

Presenters: Karla Butterfield, Steven Winter Associates, Inc.

TECH-34 Reviewing the Research: Making the Case for Mineral Fiber Insulation
Builders have many choices for insulation products in new home construction, but shouldn't the insulation products they use be thoroughly tested? Fiberglass and mineral wool insulation products are the most thoroughly researched insulation products on the market and an abundance of data exists on the long-term safety, sustainability and performance of these products. Hear the results of recent research conducted by independent third-party labs and learn why such research should help inform insulation choices now and in the future.

Presenter: Charles Cottrell, NAIMA, Home Innovation Research Labs

TECH-35 Chemical Dependency – addiction to the chemicals in building materials
Not a literal addiction, builders are not snorting OSB, but we cannot build or live in a home that does not have an excessive amount of chemicals.
This session will cover the existing chemical disclosure policy's, red list, California's prop 65 requirements and more.
I will include the top 10 chemicals commonly found in newer home materials, how to test for them and the studies that document the health impacts.
Of course, there is a case study where the material data sheets (SDS) were evaluated for every building material that was installed in a newly constructed home. Only the "healthiest" low chemical products were selected. After the home was completed it was tested and the results were... (you need to come to the session to see).

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This session will demonstrate why ventilation is the only way to combat chemical dependency. Homes are getting tighter and people are spending more time indoors with more chemicals. It's time for an intervention!

Presenter: Joe Medosch

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Opportunities for HERS Raters with the IECC

ICC-1 What's in Store for the 2021 International Energy Conservation Code (IECC) Cycle?
The IECC is updated every three years. The 2021 IECC code cycle began in January 2019 with the deadline for submitting proposals to amend the IECC. There have been a number of proposals submitted that will affect the Energy Rating Index and performance compliance paths. This session will showcase proposals submitted by RESNET, NAHB, the Energy Efficient Codes Coalition and the Leading Builders of America.

Presenters: Ryan Meres, RESNET; Bill Faye, Energy Efficient Codes Coalition; Clayton Traylor, Leading Builders of America; NAHB representative

ICC-2 New Business Opportunities for HERS Raters – RESNET Positioning HERS Raters as the Go To Resource for Energy Code Compliance Verification
In addition to verification of compliance to the International Energy Conservation Code (IECC) Energy Rating Index option, verifying compliance to the other compliance options of the IECC represents a great opportunity for HERS Raters to expand their business portfolios. The performance path is increasingly used by builders to demonstrate compliance to the energy code. Since the 2012 the IECC's prescriptive path requires both air and duct leakage testing. It is natural that HERS Raters provide these verification services to builders.

RESNET is partnering with the International Code Council (ICC) to provide HERS Raters with the credentials to be able to demonstrate to building code officials their credibility. These efforts include:

- Special training and testing for ICC certification as energy code verification at the RESNET Conference
- Development of a digital ICC/RESNET credential badge for HERS Raters who have been certified by ICC for energy code verification that can be presented to building code officials.
- A special online ICC training and certificate for HERS Raters to demonstrate their proficiency with the IECC performance compliance path.
- A uniform ICC/RESNET IECC performance compliance verification report that HERS Raters can produce with their HERS Software.

This session will explain these new benefits and explore their opportunities for HERS Raters.

Presenters: Steve Baden, RESNET; Mark Johnson, IECC

ICC-3 From HERS Rater to Code Official*
There is a growing concern about future shortages in Building Code Officials and RESNET is working to educate the general community of the value of HERS raters to the verification of

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energy codes. HERS Raters also have an opportunity to work directly for building departments to help enforce energy codes. Using their experience as a HERS Rater, they can help create a culture in the building department to help support the enforcement of code using the HERS Rating system. We will hear from current building officials who were former HERS Raters about how their experience has helped them in their enforcement of their local energy codes.

Presenters: Robby Schwarz, EnergyLogic; Co-Presenters TBD

ICC-4 The Dating Game: Energy Code Style
Come see 3 HERS Rater Suitors compete for the business of a builder! In the past, this builder has been meeting, but not exceeding the statewide energy code. But a new statewide energy code is looming and this builder is wondering if the new ERI pathway is an option worth pursuing, especially since (s)he is constructing homes across multiple jurisdictions – and let's face it… not all building departments do things the same way. This builder is going to throw some tough questions and situations (based on real experiences) at the HERS Rater Suitors. Let's see if any of them can win the business!

Presenters: Lauren Westmoreland, Southeast Energy Efficiency Alliance; Abe Kruger, SK Collaborative

ICC-5 Oh No! Inconsistency in Calculating RESNET/ICC ANSI Standard 301 and 2018 International Conservation Code Section 406 Compliance Scores*
In the International Energy Conservation Code (IECC) the International Code Council (ICC) recognized the RESNET/ICC ANSI Standard 301 for calculating Energy Rating Index (ERI) scores for compliance to Section 406 of the code. At the same time the ICC modified the 2018 IECC Section 406 to require a difference reference home ventilation rate calculation. This means there will be a difference between ERI scores and Section 406 compliance scores. How big a difference will this inconsistency cause? In a study commissioned by RESNET the Florida Solar Energy Center has calculated that Section 406 will raise scores ranging from 2 to 9 points depending on the climate session.

This session will present the results of the Florida Solar Energy Center.

Presenter: Philip Fairey, FSEC

ICC-6 Ratings for Energy Code Compliance*
With at least 14 states incorporating the Energy Rating Index (ERI) into their energy code, the HERS industry is being thrust into the spotlight, making accuracy and consistency of ratings even more important. But the idea of performing ratings for energy code compliance has raised a number of questions for raters, builders, and code officials. What is an Energy Rating Index and is it different from the HERS Index? Are ratings for code compliance subject to RESNET QA processes? Is duct leakage testing required even when the code has an exception? What documentation should be provided to code officials? Are raters responsible for verifying other

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"mandatory" requirements in the code? Is there any oversight of people doing blower door or duct leakage testing and not full ratings? Learn about how the energy code requirements and RESNET standards overlap and diverge and join the discussion to help reach consensus.

Presenters: Mike Turns, Performance Systems Development

ICC-7 Energy Code Challenges – The Code Official Perspective
In the spring of 2018, PSD issued an online survey to Massachusetts building industry stakeholders. The survey was designed to collect feedback on energy code challenges and related training and education needs and inform the activities of the Massachusetts Codes and Standards Compliance and Support (CSCS) Initiative. The survey received a total of 118 responses, comprised of 65 percent code officials, 13 percent energy professionals, and 7 percent contractors and builders. Learn about which areas of the energy code building code officials perceive to be the most challenging for enforcement and compliance, including HVAC design, compliance path confusion, and whole-house mechanical ventilation. Then join a discussion about how HERS raters, combined with standardized documentation, can be a part of the solution.

Presenter: Mike Turns, Performance Systems Development

ICC-8 2021 IECC: Potential Changes to the Energy Code that can Impact Residential Buildings
The 2021 ICC International Energy Conservation Code Code Development Cycle will start in 2019 and it is anticipated that several hundred proposals will be submitted that will impact the residential and commercial provisions of the energy code. Changes to the residential provisions could have a positive or negative impact on the ERI approach, envelope air leakage requirements, or other efficiency provisions that could impact the RESNET membership. This session will provide an overview of the proposed changes to the provisions of the IECC that will have a large impact on residential energy efficiency and that could have an impact on RESNET. This session will also provide a brief overview of the code develoopment process and how RESNET members can get involved to support or oppose changes to the IECC.

Presenter: Eric Makela, New Buildings Institute

ICC-9 The Evolution of Energy Codes
By dating back to the early Model Energy Codes of the 1990's and settling on the benchmark 2006 IECC, then examining the widely adopted 2009 IECC to the landmark 2015 version and beyond, this session explores how the energy codes of old shaped where we are today and also where we are going. Join Mike and Lauren for an insightful look into the evolution of residential energy codes. See how game-changing technologies (such as low-e windows and blower door and duct testing) advanced through adoption and inclusion in the latest energy codes. Learn from the past (the origins of energy codes) to understand the present (our most recent codes) and grasp a sense of where future codes will lead us.

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Says Mike, “I’ve always loved history and tried to appreciate the perspective of those that came before me.” Lauren adds, “Reviewing energy codes also helps to shape where we’d like to go and how we might get there.”

Come join us as this session will wrap with Energy Code Trivia - Win prizes!

Presenters: Mike Barcik, Southface Energy Institute; Lauren Westmoreland, Southeastern Energy Efficiency Alliance

ICC-10 Power Point Assisted talk; Approximate One Hour can Work*
Code compliance has three pathways: Prescriptive (which sets the framework), Trade Off (limited and now used less), and the Performance Cost Approach which is the most used. We are most interested in this cost-to-live-in analysis. The attached energy feature cost projections are intended to highlight cost effective energy upgrades and therefore effective building standards. In Ohio In 1995, the original Model Energy Code simply added more insulation to uninsulated areas of the shell. With the declining value of added insulation and our improved building standards, adding more R-value now must stand up to a cost comparison of the feature improvements. In Ohio In 1995, the original Model Energy Code simply added more insulation to uninsulated areas of the shell. With the declining value of added insulation and our improved building standards, adding more R-value now must stand up to a cost comparison of the feature improvements.

Presenter: Paul Rimelspach, Energy Designed Homes (sm)

ICC-11 What is an Energy Raters Role in Energy Code Enforcement?
What is a rating and how does it interact with code compliance. Do code jurisdictions understand what Energy Raters do? Do Raters understand the code? What's mandatory, prescriptive, performance? Is grade 3 code compliant and if not how can it be used to generate an ERI score? There are lots of questions about how to integrate 3rd party Energy Raters into the work of code compliance. We will figure it out in this session.

Presenter: Robby Schwarz, EnergyLogic

ICC-12 The 2021 IECC Code Development
The 2021 IECC code development hearings are underway. Proposals have been submitted and the public comment hearings will be held soon. Come learn what some of the more impactful proposal are and there potential to change implementation of the IECC in your jurisdiction.

Presenter: Robby Schwarz, EnergyLogic

ICC-13 IECC Energy Rating Index Compliance - it’s more than a Score.

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What does Section R406 of the IECC actually say is required to demonstrate compliance with energy code. Its more than an index score. Come learn what a rater and builder really have to do to comply with the IECC using this pathway.

Presenter: Robby Schwarz, EnergyLogic

ICC-14 The 2015, 2018, and 2021 IECC Energy Rating Index vs. the HERS Index - can they both survive?
The IECC codifies the Energy Rating Index at a specific point in time in the development of the RESNET/ANSI 301 standard. Therefore, as the 301 standard continues to move forward in development the IECC is fixed in time. In this way the ERI and the HERS Index scores are diverging from each other. What will this mean for our industry? Lets explore this issue.

Presenter: Robby Schwarz, EnergyLogic

ICC-15 What are Pathways in the IECC and why Should a Rater Understand Them?
The IECC has 4 defined pathways of compliance each with differing levels of flexibility. As a potential 3rd party implementer of the code it is important to understand the pathways and what a code jurisdiction may require of you. This session will clearly define the paths and the potential role of the Rater in each.

Presenter: Robby Schwarz, EnergyLogic

ICC-16 What's New in the World of 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. The standards available for reference by RESNET and in the codes are ever-changing as 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.

Presenter: Theresa Weston, DuPont Performance Building Solutions

ICC-17 A Standardized and Open-Source ERI Calculation Method
RESNET has embarked on a multi-year mission to increase the consistency of HERS Index scores calculated by HERS software tools. For the past 6-12 months, the National Renewable Energy Laboratory has been collaborating with HERS software providers on development of a standardized and open-source ERI calculation method available to all software developers. If broadly adopted, the solution will virtually eliminate inconsistencies in HERS Ratings while maintaining private-sector innovation and competition. The software takes advantage of existing open-source products including OpenStudio/EnergyPlus, a popular and capable building energy

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modeling platform, and HPXML, an open data transfer standard used by over a dozen software tools. This session will provide an overview of this resource, an update on the current status, and two examples of how it may be leveraged by private-sector software companies including Pivotal Energy Solutions and Wrightsoft Corporation to support the growing demand for ERI scores in the marketplace.

Presenter(s): Scott Horowitz, National Renewable Energy Laboratory; Bob Burns, Pivotal Energy Solutions; Ethan Croteau, Wrightsoft Corporation

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Rating Water Efficiency

WER-1 Mythbusting Hot Water Misconceptions
The water heating landscape is ever evolving with new products and tools to quantify efficiency benefits. The myriad options can raise several questions: Are heat pump water heaters or tankless gas units better? What are CO2 water heating units? Are structured plumbing layouts necessary with WaterSense fixtures? To add to the confusion, every building science professional has some pre-conceived notion about what does and does not influence energy efficiency. One way to analyze the options, is to consider the impact of both the Water Rating Score and the forthcoming Water Rating Index tools. This session will address common misconceptions about HPWHs, on-demand recirculation systems, routine maintenance, plumbing design, and more.

Presenter: Dan Wildenhaus, TRC

WER-2 What You Don't Know You Don't Know About (Hot) Water
Once we build a very high performance building from the perspective of heating, cooling and ventilation and install high efficiency lighting and plug loads, we are left with what to do about hot water. Hot water is a system: heater, distribution piping, plumbing fixtures and appliances, waste heat that runs down the drain. Overlay occupant behavior and then change technologies from what we are used to. To top it off, the way most of us were taught to design hot water systems is based on information that is more than 20 years out of date. This session will present practical measures you can incorporate into your next project that result in high performance hot water systems and very satisfied customers.

Presentation objectives:

- Identify at least 5 things you didn't know your didn't know about hot water
- Understand the value of pressure compensating aerators.
- Verify that the amount of water, energy and time it takes for hot water to arrive at a fixture is significantly larger than the volume that is in the pipe.
- Compare the pressure drop through modern fittings with the values in our engineering tables.

Presenter: Gary Klein, Gary Klein and Associates, Inc

WER-3 How Low Can We Go? How Close Can We Get?
From the point of view of the hot water distribution system, there are really only two floor plans: those in which there is a compact relationship between the wet rooms and the source of hot water and those which aren't compact. Compactness has several potential benefits: improved health and safety, increased efficiency of water, energy and time, reduced cost of construction and reduced cost of operations and maintenance. This session will explore the practical limits of compact design and the implications for the plumbing industry. We will also estimate the potential benefits of putting all of the best practices that work well together into the same occupancy.

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Presentation objectives:

- Understand the relationship between the logical worst-case and logical best-case floor plans.
- Distinguish between wet rooms and dry rooms.
- Describe how compact floor plans for wet rooms improve the water, energy and time efficiency of hot water systems
- Understand why compact floor plans for wet rooms improve the health and safety of plumbing systems

Presenter: Gary Klein, Gary Klein and Associates, Inc.;

WER-4 You've Heard of WaterSense and You've Heard of HERSH2O. But What do the Two Have to do with Each Other?

The EPA WaterSense Homes program was designed to give consumers and building professionals the ability to easily define and identify high performing, water efficient homes. But the building industry has changed substantially since the program was first introduced in 2009. Based on feedback from stakeholders, years of operational knowledge, and changes in the home building marketplace; EPA is planning a series of updates to the WaterSense labeled homes program that will result in a greater focus on quantifiable water savings, performance, and leveraging new tools in the market. In the meantime, RESNET has been developing the HERSH2O water rating index with the aim of creating a companion product to HERS for water, one of our most vital resources.

Through this planned partnership, EPA and RESNET hope to establish a powerful link between WaterSense and HERSH2O. The session will highlight the anticipated changes to WaterSense labeled homes and delve into how HERSH2O can contribute to the revised program's efficiency requirement. thus allowing the programs to work in concert with one another with the goal of creating a clear message about a home's water use.

Presenter: Jonah Schein, WaterSense US-EPA; Ryan Meres, RESNET

WER-5 Lessons Learned from the HERSH2O Pilot Phase

The RESNET Board approved the technical guidelines for $HERS_{H2O}$ in February, 2018. After rating a limited sample of test homes, a formal pilot phase was launched in June of 2018. During a six-month period, raters and builders have been testing the $HERS_{H2O}$ calculation spreadsheet, inspection checklist and inspection guidance document. Come to this session to learn how to use the calculation spreadsheet to obtain a $HERS_{H2O}$ rating and hear about the rating process from a builder and HERS rater that participated in the pilot. As RESNET prepares for a full launch of $HERS_{H2O}$ in 2019, this is a can't miss session for raters and builders that want to rate homes for water efficiency.

Presenter: Ryan Meres, RESNET

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WER-6 The Launch of HERS$_{H2O}$
As drought becomes a common household word across our nation, how can builders and homeowners keep ahead of water shortages, yet still have a functional home and yard? This session will present RESNET's **HERS$_{H2O}$** Program and discuss water-saving ideas.

After the completion of a pilot phase in 2018, RESNET is preparing a full launch of HERSH2O in 2019. This session will cover the past, present and future of RESNET's work to develop a whole-house water efficiency rating. Raters, builders and suppliers will learn about HERSH2O ratings and how they can be involved. This session will explore how HERSH2O fits into the residential water efficiency landscape, how water utilities can use it to drive efficiency and the potential impact of HERSH2O in reducing water consumption.

Presenter(s): TBD

WER-7 Who's RICI and How Can She Improve My HERSH2O Score?*
The Residential Irrigation Capacity Index (RICI) is part of the calculations to determine the HERSH2O Index Score. Since irrigation has a significant impact on a home's water use, understanding how RICI works can allow builders to reduce water consumption and drive down their HERSH2O scores. Come to this session to learn from irrigation and rating experts about what RICI is and how it can be used to improve water efficiency and reduce a home's HERSH2O score.

Presenter: Jonah Schein, U.S. EPA; TBD, Southern Nevada Water Authority; TBD, Energy Inspectors

WER-8 Water Efficiency Innovations: How to get credit in the Water Rating Index and HERSH2O?*
The first preliminary draft standard (standard) of the Water Rating Index (candidate-BSR/RESNET/ICC 1101-201x) went out for public comment on August 3, 2018. Section 6.2 of the standard allows for water rating providers to petition for adjustment to the Water Rating Index for a rated home with features or technologies not addressed by approved software rating tools or the standard. Come to this session to learn about the types of systems and technologies covered by the standard and the process for petitioning for an adjustment when a system or technology is not covered.

Presenter: John Bell

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Tapping the Appraisal and Real Estate Market

TAP-1 Tapping the Real Estate Market for Energy Performance – The RESNET - Pearl National Home Certification Collaboration
Pearl's certification system enables home buyers to see and understand the value of a home's high-performing assets of an existing home when the home is sold. The Pearl Certification targets retrofits and existing homes. An appraiser authored study on Pearl Certified homes showed a 5% premium when the homes were marketed correctly. Pearl is the only private certification firm to sponsor the U.S. Department of Energy's prestigious Home Performance with ENERGY STAR program. Pearl is a National Association of Realtors (NAR) REach Accelerator company.

RESNET and Pearl are cooperating in a collaborative fashion to mitigate potential confusion among consumers and the real estate and appraisal communities. The collaboration efforts are aimed at explaining that two systems are complimentary and not competitive and develop a synthesis. This effort will avoid confusion in the market place and can lead to greater HERS presence in the existing homes.

Presenters: Robin LeBaron, Co-Founder, President and COO Pearl National Home Certification; Steve Baden, RESNET

TAP-2 The RESNET – Appraisal Institute Partnership – Implications for the Real Estate and HERS Industries
For three years RESNET and the Appraisal Institute has had a dynamic partnership to promote green and high energy performance homes in the market place. To date this partnership has resulted in HERS Raters having the opportunity to auto-populate the Green Appraisal Addendum and the launching a portal that allows appraisers access to HERS rated homes data in the RESNET National Registry. This session will feature the RESNET Executive Director and the President of the Appraisal Institute discussing the results of the partnership and new directions that it can take. The discussion will also address the implications for the housing industry.

Presenters: Steve Baden, RESNET; PRESIDENT of AI, Appraisal Institute

TAP-3 Raters, Realtors, and Referrals
HERS Raters, third party inspectors, and consultants are frequently seen as an extra (and sometimes unnecessary) expense in the homebuilding industry. Often, energy professionals rely on utility incentives, government rebates, and code mandates to show value in their services. So how can you build your business without them? By building your network!!! Real estate professionals are still largely under-educated in all markets of the country. They are engaged in 9 or 10 residential property transactions, yet very few understand the importance of energy efficiency and building science. Increase your client base, improve your revenue, and build your brand by creating and leveraging your Realtor relationships.

Presenter: Todd Gamboa, Building Trust LLC

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TAP-4 The HERS Value and Potential Liability in the Appraisal Process
The HERS Rating is a valuable data point in the appraisal process. The energy rating and estimated savings are units of comparison that valuation professionals are beginning to understand and implement into their work product. The secondary mortgage market acknowledges the HERS Rating, along with a few other energy ratings. This session will focus on the importance of the HERS Rating, RESNET Appraiser Dashboard and rater liabilities attached to both professions. You can't afford to miss this powerful session that will give you valuable insight and tips for your clients.

Presenters: Stephen S. Wagner, MAI, SRA, AI-GRS, Appraisal Institute; Sandra K. Adomatis, SRA, LEED Green Associate, Adomatis Appraisal Service

TAP-5 From Listing to Closing: The Role of HERS in the Real Estate Transaction Process
This session will walk attendees through the real estate transaction process from listing to closing and illustrate the key steps impacted by the HERS Index Score. Attendees will also hear about what RESNET is doing to drive HERS Index scores into the real estate transaction, including the newly launched API for MLS data aggregators and the Appraiser Portal. Builders, raters and real estate professionals will walk away from this session with a clear understanding of how the HERS Index fits into the real estate transaction and how they can work in their local market to drive change.

Presenters: Ryan Meres, RESNET; Sandra Adomatis; Kelly Langley

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The Emerging Multifamily HERS Rating Market

MF-1 Evolving Toward Zero in Affordable Multifamily
Affordable multifamily construction poses both unique challenges and opportunities for healthy indoor environments and energy, water, and material efficiency. While scheduling and cost often dictate specifications, many housing authorities and lenders require demonstrated efficiency for funding. It's typical for a developer to start with a HERS rating or Energy Star and then evolve toward more rigorous programs like LEED or Zero Energy Ready Homes and Passive House. The progression involves building upon past successes, identifying challenges with the thermal envelope, and specifying small and efficient HVAC equipment.

Presenter: Karla Butterfield, Steven Winter Associates, Inc.

MF-2 Developing a RESNET ANSI Standard on Calculating Energy Rating Index Scores for Multifamily Housing
Multifamily construction is one of the fastest growing segments of the housing industry. Currently the RESNET/ICC ANSI Standard for calculating Energy Rating Index Scores only covers residential buildings below four stories. For several years the RESNET Standard Development Committee 300 has been developing an ANSI candidate standard for residential buildings higher than four stories. This session will provide an update on the status of the new standard amendment, how it addresses multifamily homes and a timeline for the development of the standard.

Presenters: Gayathri Vijayakumar, Steven Winter Associates, Inc.; Thiel Butner, Pando Alliance

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The Latest on Enhanced HERS Index Consistency and QA

QA-1 The Future of QA is Now - Using Technology to Create a Robust Quality Management System*

Cloud based business management systems, remote video conferencing, advanced data analytics, and chat bots have all been used to support quality assurance/quality control in a variety of industries. RESNET staff have recently been using some of these technologies to aid in their quality assurance efforts of providers. However, Providers also have tools available to stay ahead of the curve to help create a more robust quality management system of their own. Join us in this exciting session to hear about how EnergyLogic is currently using technology to aid in the quality management of the ratings we certify.

Presenters: Glenn Pease, EnergyLogic; Jordi Kimbrough, EnergyLogic

QA-2 Evaluating the Consistency of HERS Index Scores – A RESNET-New Buildings Institute Rater Variability Analysis

Code jurisdictions and utility programs across the nation are increasingly relying on HERS Raters and HERS Index scores to verify the energy performance of homes. In many cases a HERS Rater must use professional judgement in the analysis of a home. This naturally leads to variances among HERS Raters. Just how large of a variance is there among HERS Raters? To answer this question RESNET is teaming up with the New Buildings Institute to conduct a comprehensive variability analysis. Unlike other field variability studies that involved a small number of homes and HERS Raters in an artificial setting, the RESNET/ New Buildings Institute's analysis will involve every home that was HERS rated in 2017. This means that the analysis will cover over 226,000 homes that have had confirmed ratings and entered into the RESNET National Registry. The homes will undergo an analysis by the QA Genie application which is a set of algorithms that will scan the building files in the RESNET registry and identify patterns of outliers in the homes rated by the Rater. This will not only identify variances in HERS Index Scores but also identify variances in the energy features of a Rater's homes.

Based upon the QA Genie review the New Buildings Institute will analyze the results and write a report.

In addition to answering the question of the variability among HERS Raters this analysis will identify areas where RESNET will need to step up its quality assurance oversight as well as its mentoring and training efforts.

Presenters: Ryan Meres, RESNET; Eric Makela, New Buildings Institute

QA-3 Top 10 QA Findings Countdown

Quality assurance is critical to the success of RESNET and the HERS industry. RESNET requires QA Providers to perform both field and file QA on an ongoing basis. However, QA goes beyond simply reviewing files and showing up at a few houses, and it should start with education and mentorship to prevent issues from being found during the QA review by ensuring raters get

*Submitted as an ADVANCED session

the right answer the first time. With this in mind, please join experienced Quality Assurance Designees from some of the largest RESNET QA Providers in the industry to discuss our experience with the Top 10 QA findings that we observe on an ongoing basis. Our goal with this session is to educate Raters on these issues so as to foster greater understanding and accuracy.

Presenters: Chris McTaggart, Building Efficiency Resources; Glenn Pease, EnergyLogic; Another QAD from a Direct Rating Provider

QA-4 Quality Assurance Data Files Made Easy
The Standards say you need a Quality Assurance Data File but a Quality Assurance Data File has a vague definition and little guidance exists on what one should look like. This session will discuss the intent of a rating data file, from field verification for your builder client to their crucial role in the Quality Assurance review process. We will also discuss strategies for streamlining your data collection to reduce busy work while maintaining transparency and increasing accuracy.

Presenters: Ben Graham, EnergyLogic Inc.

QA-5 RESNET QA Team's Observations from the Field
Join Billy Giblin and Scott Doyle as they share observations and findings from their visits with QA Providers in 2018. They will share what they found as well as best practices. This session counts as the annually required QAD roundtable.

Presenters: Scott Doyle, RESNET; Billy Giblin, RESNET

QA-6 RESNET Online Quality Assurance Reviews and the Power of QA Genie*
The RESNET QA Team will discuss the results of their 2018 online QA reviews as well as how QA Genie is used to analyze ratings in preparation for the reviews. The session will cover the findings from the online QA reviews along with trends and common flags in QA Genie.

Presenters: Scott Doyle, RESNET; Billy Giblin, RESNET

QA-7 RESNET Quality Assurance - Where Are We Today?
The landscape of RESNET Quality Assurance has significantly changed in the past several years and efforts have ramped up to ensure consistency. The RESNET QA Team has doubled, field QA reviews began in 2018 and technologies like QA Genie are being used. Attend this session to learn about these efforts and much more!

Presenters: Scott Doyle, RESNET; Billy Giblin, RESNET; Laurel Elam, RESNET

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QA-8 When Does it Make Sense to Hire Independent QADs? - Value to Providers Using Third Party QA

RESNET may be moving away from a requirement of financial independence of providers and QADs, however there are still situations where Providers should consider hiring third party QA contractors. The benefit of doing so when considering the value add of these services can make for a very effective partnership, even in competitive markets. Many Providers have QADs whose skills could be used elsewhere in growing the business and/or focusing on internal process and resource management. Join us to hear from providers who will share their stories of success in Third Party QA.

Presenters: Glenn Pease, EnergyLogic; TBD

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