

TUESDAY WORKSHOPS

FULL-DAY WORKSHOPS

9am - 5pm

A How-to Guide to Carbon-Neutral Cities

Cityview 1

At NESEA we know how to make really good buildings. But we can only solve so many problems with better buildings. We need to start working just as collaboratively and thoughtfully on making better cities and regions. In this full-day workshop, you'll have an opportunity to engage with real-world practitioners from three different countries whose home cities have established quantifiable plans for achieving carbon-neutrality within our lifetimes. The goal of this workshop is to provide participants with the framework and tools to go back to their own communities and do the same. We'll look at support provided by national, regional, and local governments; the role of carrots and sticks; ways to engage the private sector; and the importance of public perception, opposition, and support. Participants will have a chance to review the plans each municipality has developed and challenge the planners with the hard questions about dream versus reality. **Gustaf Landahl (City of Stockholm), Robert Leaver (New Commons), Susanne Rasmussen (City of Cambridge)** C B

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GOODYCLANCY



Calculating the Life Cycle (Cradle to Grave) Impacts of Buildings

Cityview 2

It is a tall order for humanity to become healers of the planet. In order to do so, people need to tap into new avenues of influence that are not yet sufficiently explored and identified. It is essential to lessen the environmental impacts of buildings in ways extending far beyond operational energy and carbon by considering a holistic view of material and energetic flows across a building's full life cycle (through life cycle assessment). At the same time we must consider how to give back to the planet and create a regenerative future (handprinting).

This workshop will demystify the important practice of life cycle assessment (LCA) and inspire (in the morning) with an overview of handprinting, which identifies how we not only do less harm, but change things for the better. Participants will gain the skills needed to calculate the life cycle impacts of buildings across their full life cycle – material production, transport and construction, material replacement and maintenance; and finally material disposal or re-cycling, and to use the results during the design process to evaluate design options and identify low-impact solutions. In the afternoon, participants will learn about the current state of the science of LCA practice, how to interpret and compare LCA results, and the integration of LCA into certification schemes, such as LEED and the Living Building Challenge. Presenters will share case studies in which LCA informed design decisions, and participants will generate a series of comparative LCAs using Tally, a Revit-integrated LCA tool. Participants are encouraged to bring examples of material, assembly, or whole-building LCAs and thoughts and questions about this emerging practice.

Stephanie Carlisle (Kieran Timberlake), Greg Norris (International Future Living Institute) D B

Diagnosing & Air Sealing Large Commercial & Institutional Buildings Beacon Hill Complex

If you want your large commercial or institutional project to meet your savings number, exceed energy performance goals, or get your label, you need to perform targeted air leakage diagnostics and actually fix the leaks. There are numerous other reasons to retrofit a buildings envelope including comfort, humidity control, infestations, component degradation or simply being able to control a building. One of the nation's leading experts in this field will walk you through the hundreds of miles and millions of square feet of buildings that he has diagnosed and fixed over the last few years, and show you real results from real buildings. This day-long seminar will also provide the opportunity to discuss practical solutions to the problems encountered.

Larry Harmon (Air Barrier Solutions, Inc.) I E

Areas of Focus

- S - Single Family
- I - Commercial & Institutional
- P - Policy & Codes
- L - Mechanical Systems & Lighting
- R - Renewables
- C - Cities Communities Place
- D - Design & Construction Process
- B - Beyond Energy (Water, Carbon, etc.)
- F - Finance & Banking
- E - Building Envelope
- M - Multifamily

Getting to Zero: Frameworks & Roadmap to Help You Achieve Portfolio-Wide Performance Improvements

Harborview 1

The future of our planet and our profession depend on our ability to co-create collaboratively and achieve levels of synergy that transform our impact. Net Zero, the 2030 Challenge, and LEED define performance targets. Yet, critical gaps remain between rising performance goals and the organizational capability to consistently achieve them. AIA 2030 data shows that 57% of gsf uses energy modeling, meaning 43% doesn't. Most teams don't know what the anticipated energy use is. Firms also report that LEED certified projects, which tend to have more commitment and higher levels of integration, have 24% lower pEUI than non-LEED projects, yet LEED still represents a small percentage of a firm's portfolio. This session provides participants with frameworks and proven methodologies to transform their practice from "random acts of sustainability" to consistent capability based on clearly articulated methodologies, truly integrative design and effective use of metrics to achieve continuous improvement.

Barbra Batshalom (Sustainable Performance Institute) S I D M

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MORNING WORKSHOPS

10am - 1pm

Hacking LEED: v4 Innovation and Performance

Waterfront 1

How will green building practitioners use the updated and mandated LEED v4 to raise the bar on energy & environmental performance in buildings? At the end of October 2016, the current LEED 2009 system will no longer accept new projects and all projects will be registering in v4. Will you be ready? What point and point complexes will help you through the new maze? How do pilot credits and innovation credits fit? Are you watching how legacy projects registered in v2009 are subject to changing requirements even now? Yes! You have heard all about how LEED v4 is coming. Well, this year it's here and you will be using it. Learn from practitioners who are already waist-deep in the v4 waters. Sponsored by MA USGBC.

Jim Newman (Linnean Solutions), Erik Ruoff (The Green Engineer) | P

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Sketching with Numbers

Cambridge Complex

It's about time we stop ignoring the full impact that design, construction, and development really have. We cannot stop at net zero operational energy but instead need to consider all of the aesthetic, carbon, embodied energy, community, and financial impacts of work. No one ever said socially and environmentally responsible development would be easy, but that doesn't mean it is impossible. This workshop will look at how Placetaylor incorporates quantitative analysis into the design phase of small-scale residential development work to create dwellings that are architecturally interesting and super insulated, have lower embodied carbon, are located in urban infill and are based on an integrated analysis of finances and energy. This is a workshop about raising the bar, exploring the idea of a "net positive impact", and getting hands-on experience using the Placetaylor developed "Gizmo", a spreadsheet tool that converts these conceptual inklings into practical analysis.

Declan Keefe (Placetaylor, Inc.) | D B

The German Perspective on Building Energy

Waterfront 3

Germany has established itself as an international market leader and innovation driver in the fields of energy efficiency and green building. This workshop will provide information about innovative building energy models and technologies. A select group of German companies and experts will present their latest products and reference projects.

Dr. Stefan Hardt (Meteoviva), Kay Künzel (Raum Für Architektur), Matt Capone (Aluthermic), Todd Bachelder & Alan Wall (Menck Windows) | L

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What Should be Done with This House?

Waterfront 2

What will your existing house look like in the year 2050, if it's to be part of the solution to the energy and environmental issues we face rather than a continuing part of the problem? What's the pathway to get it there over time – how might a "phased retrofit" break down into logical, cost-effective steps? In this workshop, two long-time practitioners (and homeowners) will lead the group through a series of case studies to develop master plans for a range of houses. We'll be looking not just at the homes and their existing internal systems, but also the various external systems and networks the homes participate in – social, transportation, legal and zoning, energy, natural, etc. Participants will be encouraged to submit their own or clients' homes to the workshop leaders in advance to be prepared as case studies for group discussion. This workshop is open to homeowners and professionals both.

Paul Eldrenkamp (Byggmeister, Inc.), Ken Neuhauser (Building Science Corporation) | S E L

TUESDAY WORKSHOPS

AFTERNOON WORKSHOPS

2 - 5pm

Affordable Passive House Commercial Buildings – Secrets Revealed Cambridge Complex

High performance commercial buildings cost 10- 25% more to build than conventional buildings, right? Adam Cohen of Passiv Science has been designing and building high performance commercial buildings at costs comparable to typical new construction and achieving Passive House level results. Learn the basics of Passive House design principles specific to commercial buildings as well as the details of how buildings like dental clinics and college dormitories can be built at market rate while achieving Passive House standards. Integrated Project Management will be discussed as will details, equipment, controls and areas for capturing money typically left on the table in conventional design-bid-build projects delivery situations.

Adam Cohen (Passiv Science, LLC) | E D

Building Blocks for Green Master Planning: A Hands-on Intro to LEED ND Harborview 2

This engaging, hands-on workshop will give participants a “learning by doing” introduction to sustainable site planning principles and USGBC’s LEED for Neighborhood Development program. The workshop will begin with a short introduction. Then, using case studies developed from actual site designs, participants will complete a series of guided exercises in small teams to develop their own plans for these sites using wooden building blocks on top of the case study site plan. Teams will test development feasibility, do site design, and apply LEED ND credits to their plans. By comparing the workshop team designs and considering the actual plans, participants will explore the many ways that sustainable design principles can be applied to site planning. Teams will also gain experience with applying LEED ND prerequisites and credits to their site plans. This workshop is designed for participants of all skill levels—no prior design or planning experience needed.

Casey Studhalter (USGBC), Kimberly Vermeer (Urban Habitat Initiatives, Inc.) | C D

Building Science Puzzles Waterfront 1

No matter how long you’ve been a building practitioner, you never stop encountering building science head-scratchers. Assemblies that you thought you had meticulously detailed may leak. Materials that you thought would last decades may show signs of pre-

mature failure. Systems that seem like they should work (or have worked in the past) don’t. This workshop will teach you how to identify, diagnose and solve building science puzzles for a variety of building types, including residential, commercial and institutional, constructed using both traditional and modern methods. Presenters will share a series of case studies and invite the group to work together to identify the problems and propose solutions. Participants will also have an opportunity to present their own puzzles for group discussion. Matthew Bronski & Christopher Grey (Simpson Gumpertz and Heger, Inc.), Peter Yost (BuildingGreen, Inc.) | S I M

Can You Afford an SPF Failure? A Comprehensive Look at Assuring a Quality Foam Installation Harborview 3

As a building professional you take on a high level of risk when you use spray foam in your projects. Spray foam is the one of the few building materials we routinely use that is manufactured on-site; yet it is almost always installed without adequate quality control or the means to verify proper processing; and the consequences of material failures and/or inadequate protection of the occupants and the site can be catastrophic. That’s the bad news. The good news is that you can minimize the risks if you know what to require from installers and how to ensure that they use the proper safety protocols and quality control. This must-attend workshop will teach you everything you need to know and do to avoid problems with spray foam installations.

Henri Fennell (H C Fennell Consulting, LLC) | E D

Navigating Product Selection: How to Find the Greenest Materials in the Age of Full Disclosure Waterfront 2

Are you drowning in the arcane alphabet soup of product labels? Frustrated with inflated environmental claims from manufacturers? Unsure of the health and safety risks associated with your favorite building materials? Help is on the way! Join the experts from BuildingGreen, who have been researching and writing about green building products for 25 years. In this hands-on half-day workshop, you will learn how to cut through the greenwashing and select safer, greener products, and you’ll get an in-depth understanding of the trove of information you can find in product disclosure tools like environmental product declarations, health product declarations, and the newly required safety data sheets. Understand the full context, get down and dirty with the devil in the details, and learn which information you can safely ignore. You’ll also glimpse some of the newest, most innovative products that are paving the way for a greener future, and you

will leave with powerful educational materials to share with clients and other team members. Bring questions, share insights, and get ready for an enlightening and entertaining afternoon! Brent Ehrlich, Paula Melton & Jerelyn Wilson (BuildingGreen, Inc.), Alex Wilson (Resilient Design Institute) | S D B M

Redefining Water Use and Waste: The Living Building Challenge Water Petal Waterfront 3

The Living Building Challenge Water Petal is intended to showcase a new age of design, where water is used as a resource, and nothing is left to waste. This workshop will take a look at the components of the Living Building Challenge, with a deep focus on the requirements of the Water Petal. Participants will develop an understanding of why water is such a critical issue in the built environment and the positive impact professionals can have. The forum will include Institute and project team presentations on techniques, strategies and technologies for achieving net positive water. This workshop will also include a discussion of issues and solutions related to water policy and what is needed next to make it easier for project teams and policy makers alike to support integrated water management. Brad Liljequist (Net Zero Energy and Living Community Programs) | D B



It's 2040: Eastie floods twice daily.
How can design help?

For East Boston, the tides soon will be high. But residents can begin to incorporate design principles and practices that will allow the city to live companionably with water instead of being victimized by it.

Learn more:
architects.org/eastie

OPENING PLENARY

8:30 - 10am

Opening Plenary: Key Challenges and Opportunities of Our Times, Part I Plenary Space/Trade Show Floor

As NESEA and BuildingEnergy lead the charge to create low-energy buildings and transition to renewables, we must also grapple with the broader implications of the ways we build and power our buildings: What are the health impacts of our material choices? What is the role of big data in advancing efficiency? How do our building practices influence our sense of community connection? How do we balance building scale approaches to climate change with community and regional scale approaches? In this two-part plenary, internationally renowned thought leaders will share their cross-disciplinary work to address energy and climate change, as well as environmental challenges that go beyond energy. Free with Conference or Trade Show pass.

Michelle Addington (Yale), John Farrell (Institute for Local Self-Reliance), Gustaf Landahl (City of Stockholm)

SESSION 1

10:30am - 12pm

Aiming at Zero: The Struggle to Get There

Harborview 3

Everyone is talking about getting to zero energy by 2030. It's easy to say, but very hard to do. What is the process and how do we ratchet down our EUI on each project? How can goal setting and Client priorities influence energy use and building performance? Can we actually get to zero? This lively moderated panel discussion will include the Architect, Engineer, and Owner/ Client on Weygand Hall at Bridgewater State University (completed in 2013) and on Keene State College (currently

under construction). We will address the planning, design, and results of both projects as well as the ZNEB pilot study completed simultaneously with Weygand Hall. We will show best practices and lessons learned from each experience. We will focus on the continuum of these projects over time, how each process and learning experience influenced the next, and how this iterative approach leads to better energy performance and keeps us on track for 2030.

Yanel de Angel & Stephen Messinger (Perkins+Will), Amanda Forde (Massachusetts State College Building Authority), Jay Kahn (Keene State College), Christopher Shumway (Rist Frost Shumway) | D

Break It or Lose It: Thermal Bridging in Building Envelopes

Cambridge Complex

While thermal bridging is widely acknowledged to exist in modern commercial building envelopes, little is known on the significance of its impact. Utilizing infrared images taken from targeted assemblies at 15 recently completed buildings; we have seen a range up to 70% less than the design intended R-value. This range shows the unintended impact that design details can have on thermal performance. We identified 16 common areas of thermal bridging that were frequently observed in the buildings surveyed. Broken into two broad categories of façade systems and transitions/ penetrations, they range from curtain wall systems, to existing wall renovations, to conditions such as parapets and transitions to foundation. The outcome of this research is a better understanding of thermal performance of commercial façades in order to help architects and building professionals understand the real impact of common thermal bridges and present alternatives to the industry standards that enhance performance.

Jeffrey Abramson & Andrea Love (Payette Associates Inc.) | E

Does Electric Grid 2.0 Mean Energy Democracy?

Beacon Hill Complex

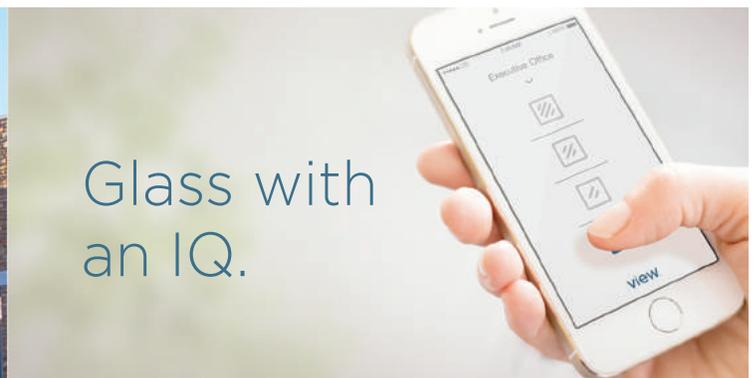
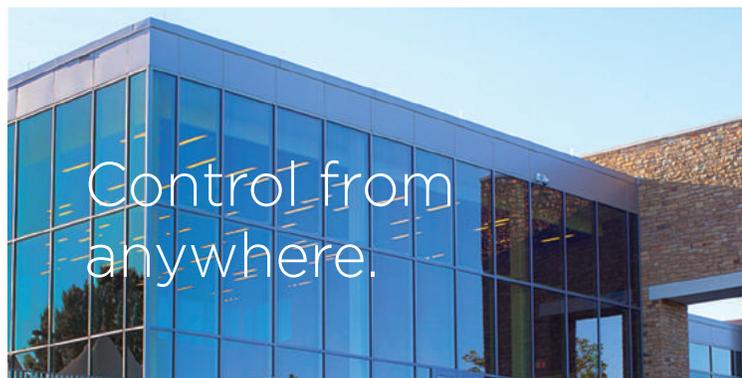
The U.S. energy system is undergoing a remarkable transformation to decentralized and renewable power. Transportation and heating are becoming electrified. Clean, renewable power is growing at an exponential rate and competing on cost with fossil fuel energy sources. Smartphones and automated controls allow an unprecedented decentralization of control. This session explores how the 21st century electric grid can give individual consumers power over their power, but only if the rules are written right.

John Farrell (Institute for Local Self-Reliance) | C B

Passive House Deep Energy Retrofits: Revitalizing Masonry Multifamily and Single Family Wood Frame Buildings Cityview 2

Michael Hindle and Matt Fine led a Passive House retrofit of three abandoned masonry apartment buildings on the Southeast side of Washington DC for low-income families. Designed to PHIUS+ standards, the renovation goal coupled with on-site renewables, and affordable housing tax credits, minimizes expenses for occupants - providing stability for resident families, while achieving nearly zero energy performance. The team designed and executed an external insulation strategy of I-joists and dense-pack fiberglass, with integrated window shading and airtightness. See the details, the processes and lessons learned. Chris West bought a raised ranch house in Jericho, Vermont. Built in 1976 the house has standard 2x4 construction (16 oc) filled with fiberglass, single pane windows, and tuck under garage. Stuck with some earlier bad choices, and issues typical to every retrofit, see how he implemented Passive House methodology and calculations, to reduce the heating load of the house by 75%.

Matthew Fine (Peabody Architects), Michael Hindle (Passive to Positive), Chris West (Eco Houses of Vermont, LLC) | M



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WEDNESDAY SESSIONS

SESSION 1 CONTINUED

10:30am - 12pm

Material Selections: A Life Cycle Perspective Viewed Through One Home

Harborview 1

Sometimes the things we think are a poor environmental choice turn out to be not so bad. Sometimes they are worse. Ben Morelli, along with Bensonwood energy & sustainability experts – Rheannon DeMond and Danny Veerkamp - will discuss the results of an LCA of a single family home; from material source through building lifespan. Life cycle assessment (LCA) is one of many emerging tools available to building designers and construction firms to measure and guide reduction of their structures' environmental impact. The presenters feel it is essential to look at a broad variety of impact categories –not just climate and energy considerations - in order to assess the trade-offs that may be associated with the emerging paradigm of advanced, green buildings. The results of this analysis confirm the importance of systemic energy reduction strategies, while challenging some of our preconceived assumptions on the relative impacts of various materials.

Rheannon DeMond & Danny Veerkamp (Bensonwood+Unity Homes), Ben Morelli (Franklin Associates) D B

Moving Beyond Faith Based Ventilation

Cityview 1

We all know that increasingly tight buildings require reliable and effective ventilation systems, not only for occupant comfort and safety but also for building durability. As with any mechanical system, the efficacy of ventilation can be compromised by a number of factors, including design flaws, improper installation, inadequate maintenance and operator error—some of which can only be caught through post-installation testing and

ongoing monitoring. The presenters will share strategies for avoiding problems in the first place, as well as for identifying and correcting common problems that may arise after installation and commissioning.

Terry Brennan (Camroden Associates, Inc.), David White (Right Environments) L

One City's Energy and Sustainability Vision and Action: Stamford, CT's Energy Improvement District, 2030 District and Pioneering Microgrid and Resilience Project

Waterfront 2

Stamford is the fastest growing city in Connecticut and has been steadily expanding a series of innovative initiatives at the intersection of economic development, sustainability and resilience. The City was a first mover in creating an Energy Improvement District with the ability to make investments in distributed energy resources and infrastructure city-wide. Stamford's 2030 District is among a few in the nation promoting green building and clean energy in commercial properties. The City is using an Energy Savings Performance Contract that is developing a microgrid at its Government Center and making resilience enhancements to emergency shelter public schools in addition to energy and water saving upgrades, the first U.S. municipality to apply this self-funding retrofit approach in this way. This panel comprises key actors from the City and its nonprofit and private sector partners who will discuss the work underway and their shared visions and plans for the future.

Hank Ashforth (The Ashforth Company), Chris Lotspeich (Celtic Energy, Inc.), Thomas Madden (City of Stamford), Megan Saunders (Connecticut Fund for the Environment), Ward Strosser (ConEdison Solutions) C

Reimagining Human Waste as an Opportunity: Water Savings and Urine Reclamation

Waterfront 1

Leaders of one of the world's largest toilet manufacturers and a visionary nonprofit will share stories from the leading edge of current water conservation technologies, and a future of entirely new approaches to managing human waste. Come hear about and engage with the latest science on the life-cycle impacts of toilet manufacture and use, and on cost-effective ways to reclaim nutrients from the waste stream. This is an opportunity not to be missed!

Nadav Malin (BuildingGreen, Inc.), Abraham Noe-Hays (Rich Earth Institute), William Strang (Toto Americas Operations) B

The Elephant in the Room: How to Affordably Increase the Energy Efficiency of Our Existing Housing Stock

Waterfront 3

The biggest hurdle for energy efficiency in the built environment today is how to improve the energy efficiency of our existing housing stock in an affordable manner. These three practitioners bring several years of experience to the fore. They have seen what works, what doesn't, and why. The session will review the best building practices of how to view, evaluate and perform an energy upgrade to a property. Average square foot costs on energy efficiency return will be discussed and what can be the expected energy reductions from certain projects. This session will focus on some of the easier energy-efficiency upgrades to be taken now and what to put off to employ our next generation. Evaluation of the existing available financial resources to be used for offsetting the owner costs and how they might be improved. Lastly, they will address when a project is beyond the scope of affordability and what telltale signs to look for.

Brian Butler (Enerscore), Brice Hereford (South River Sustainability), Sean Jeffords (Beyond Green Construction), David Joyce (Synergy Construction, LLC), Bill Womeldorf (Building Science & Architecture) S E M

Widening the Circle in High Performance Residential Design

Harborview 2

Every project is a learning experience. On some projects, we set out deliberately to learn new tricks. Mark Doughty, a luxury home builder near Boston, sought out Zero Energy Design to help him design his own home. With ZED's Jordan Goldman, he got firsthand experience in high performance home design, and will discuss how what he learned may influence what he builds for others. Architect Hank Keating sought out Mike Duclos, of DEAP Energy Group, to help him through his first Passive House project. From concept, construction and certification, Mike and Hank worked together to develop passive house strategies for a working farm, and to walk the walk through the sometimes steep learning curve that is Passive design.

Mark Doughty (Thoughtforms Corporations), Mike Duclos (DEAP Energy Group, LLC), Jordon Goldman (ZeroEnergy Design), Hank Keating (Trinity Financial) S E D

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SESSION 2

1:30 - 3pm

Airtightness Testing in Large Buildings Cityview 1

Airtightness testing has long—since the 1980’s—been used to test high-performance housing. The 2012 version of the International Residential Code requires testing of every new home. Recently there has been a growing trend of testing the airtightness of large buildings as well. This session reviews why one would invest in airtightness testing for a large building, how the testing is done, how the results are interpreted, and how this information can be used.

John Straube (Building Science Corporation) | E

Is Net Zero Energy Net Zero Benefit? Cambridge Complex

Net Zero Energy (NZE), is generally thought of as the deployment of distributed renewable energy generation at the building/load location. It is offered as a key strategy in the effort to minimize and mitigate global climate change resulting from greenhouse gas emissions. But is this strategy and definition of NZE the best strategy to accomplish these goals for every building? Are there situations when NZE is not an appropriate design objective? Should we create a new term instead of NZE? Our panel of energy professionals will present several perspectives on whether or not it makes sense to pursue NZE; or is there a better strategy for how to address net zero emissions.

Bill Maclay (Maclay Architects), Bob Somers (2rw Consultants) | C D

Combating Climate Change with Timber Construction

Waterfront 3

With its smaller carbon footprint, timber construction should be considered alongside steel and concrete to build both low and mid-rise projects. This session will introduce innovations in timber technology, and through case studies demonstrate the wide range of benefits including environmental benefits. With buildings in the U. S. accounting for 38% of all carbon emissions and with population growth on the rise, we must reconsider how we construct our buildings. Climate change can be combated in two ways – by reducing carbon emissions and by removing carbon from the atmosphere – and timber is unique in that it is the only building material that can do both. Recent innovations in timber technology are paving the way for timber once again to become integral to the fabric of cities, at this pivotal moment in time.

Peggi L. Clouston (University of Massachusetts), Jean-Marc Dubois (Nordic Structures Inc.), Whit Inglehart & Yugon Kim (Tai Soo Kim Partners, LLC)

C D B

Has the LED Revolution Caught the Fluorescent Tube?

Waterfront 2

For decades, the straight-tube fluorescent lamp has been top in efficiency and ubiquitous in indoor lighting. Justifiably, the “four-footer” is one of the last lighting types to be displaced in the LED Revolution. But under what circumstances is replacement warranted, and with what? Many are blithely retrofitting one-for-one with LED tubes and kits, achieving dramatic energy cuts, but with insufficient regard for technical, lighting, and safety considerations. Meanwhile, the line between retrofit and new-construction is blurring: code now requires that if 50% of lighting is replaced, then the space must meet strict W/sf and controls requirements. New LED fixtures can now exceed fluorescent in energy efficiency in numerous applications. The best of smart, energy-sophisticated LED lighting, offers responsible, deep savings, and can become much more the norm. With the advanced LED Revolution comes the need for more technical know-how.

Fred Davis (Fred Davis Corporation), Irina Rasputnis (NEEP), Paula Ziegenbein (Hartranft Lighting Design) | L

High-Performance Buildings are Not Enough: An Introduction to High- Performance Cities and the Next Step Cityview 2

In the United States we have historically thought in terms of high-performance buildings: we set our boundary conditions at the lot line. But buildings only work in a context of networks and grids—transportation, energy, water, social, legal. An individual building represents only one small dial to turn to affect our impact on the environment, whereas a city represents a collection of many and much larger dials. In this session, three planners will look at how three forward-looking municipalities—Stockholm, Sweden; Copenhagen, Denmark; and Cambridge, MA—are leapfrogging over “high performance buildings” right into “high-performance municipalities” by setting a vision for achieving carbon neutrality within a couple of decades. We’ll look at support provided by national, regional, and local governments; the role of the private sector; and public perception, opposition, and support. We’ll also review the plans each municipality has developed and ask the hard questions about vision versus reality. **Gustaf Landahl (City of Stockholm), Robert Leaver (New Commons) Susanne Rasmussen (City of Cambridge) | C**

WEDNESDAY SESSIONS

SESSION 2 CONTINUED

1:30 - 3pm

How We Sleep at Night - Energy Metrics and Decision Making in Residential Design

Harborview 3

PHI stands by 4.75kbtu/sq ft/yr for AHD. PHIUS has recently reworked its performance standard. Energy Star now has Version III. Living Building Challenge requires net zero. Green building standards require differing guidance on annual heat demand and peak load. Learn from long time practitioners with experience in climate zones 5, 6 and 7 as they discuss their sweet spots for appropriate metrics in peak load and AHD. Laugh while the moderator mocks, tugs and cajoles the experts while teasing out the answers to life's persistent questions (according to energy geeks).

Marc Rosenbaum (South Mountain Company), Ben Southworth (Garland Mill Timberframes), Rachel Wagner (Wagner Zaun Architecture), David White (Right Environments) S E L

Huddle Together for Warmth: Multiple Solutions for Multifamily Passive House

Beacon Hill Complex

We will show two mid-rise multi-family projects in the northeast that meet either the Passive House or PHIUS+ building energy standard. The Distillery's 28-unit Phase 1 building in South Boston, MA and the Bayside Anchor 45-unit project in Portland, ME, both now under construction, will be used to discuss the design and construction principles that are employed to radically reduce energy consumption and construct beautiful, low energy, and healthy urban living spaces. Details, testing data and lessons learned will be shared with a special focus on large scale air barrier implementation, efficient ventilation systems, and cost savings and funding metrics.

Michelle Apigian & Richard O'Dwyer (ICON Architecture), Jesse Thompson (Kaplan Thompson Architects) D M

Lightning in a Bottle I: Energy Storage Technologies and Markets

Harborview 2

Energy storage technologies such as batteries, flywheels and thermal storage are poised to reshape our energy systems at the scales of the grid, communities, buildings and vehicles, and the relationships between these categories. This first of two sessions will provide an overview of energy storage

technologies, applications and markets in the Northeast region and nationally. It will highlight the research from the Massachusetts Department of Energy Resources energy storage study underway. Is the energy storage tipping point truly in sight? What market applications are favorable for which sets of technologies? What impact will storage have on renewable energy deployment? How might electric vehicles mobilize opportunities for energy storage in the built environment? Please join us as we cut through the hype for a lively discussion of developments in this dynamic field.

Judith Judson (MA DOER), Todd Olinsky-Paul (Clean Energy States Alliance), Kiran Kumaraswamy (AES Energy Storage), Matthew Krivos (Renewable Energy Systems Americas) P R

On Eggshells: Residential Retrofits in Tricky Situations

Harborview 1

Seasoned practitioners tackle the difficulties of residential Deep Energy Retrofits. When an architect experienced with Net Zero and Deep Energy Retrofits (DERs) spends his own money on his house, things get tricky. Starting with a house that used 700 gallons of oil, Tom Hartman's been working on it for fifteen years. Now it's not quite super-insulated, pretty air tight, once haunted by flying squirrels, but now using almost no oil. With a young family whose financial priorities did not include a whole house renovation; this project is a case study of a DGR- damn good renovation. Outside Boston, David Foley and Paul Eldrenkamp ought to know better, but decide anyhow to attempt a DER on a 1928 home they thought WASN'T located in Historic Preservation District. This panel discussion will address the challenges - political, economic, and technical - of high performing renovations in existing housing stock.

David Foley (Holland & Foley Architecture, LLC), Tom Hartman (Coldham & Hartman Architects) S E D

SESSION 3

3:30 - 5pm

Biomass Design and Potential Waterfront 3

Technically rich session on system options and fuel choices for burning wood. European context and talk about similarities and differences in trying to apply European practices in the US. Topics would focus on burning Wet Chips vs. Precision Dry Chips vs. Pellets and various types of systems/ equipment appropriate to different scales of buildings and projects.

Mark Froling (Froling Energy) S R M

Cradle to Grave: The Concealed Energy, Carbon and Water Impact of Buildings

Beacon Hill Complex

Buildings already account for a third of the world's energy use, but the energy use in buildings is projected to double between now and 2050. This presents both a huge challenge and a great opportunity to improve the sustainability of this sector. All too often the focus for buildings is on the operational energy, carbon and water. However, this neglects the concealed impacts within the wider building life cycle: material production, transport, construction waste, maintenance and disposal. With improving thermal standards for buildings these concealed impacts are gaining increasing attention. This presentation will visualize the cradle to grave impacts of buildings (domestic and commercial) and will place them into perspective to draw attention to the life cycle energy, carbon and water hot spots. The presentation will close with best practice case studies of buildings that have reduced their embodied and life cycle impacts - without adding to the build cost of the project.

Stephanie Carlisle (Kieran Timberlake), Greg Norris (International Future Living Institute) B

Getting to Zero: User Engagement in Achieving Net Zero Energy Buildings

Cambridge Complex

As the A&E industry continues to focus on improving the energy performance of buildings, it's clear that some energy saving measures are outside the designer's control. Occupants play a significant role when it comes to the energy used. We engage users to discuss space needs, environmental and aesthetic desires, yet we often do not discuss users' roles in energy use. Designers must recognize the role occupants have on energy use and adjust our design process accordingly. Join us for an exploration of how design teams can bring occupants into the conversation about energy, equipment and building usage to help improve energy efficiency and help net zero energy projects meet energy use targets. This session will discuss how user engagement was incorporated in the design process on case study projects including the net-zero energy capable school for the NYC School district and the proposed net-zero energy King Open and Cambridge Street Upper schools in Cambridge, MA.

Michael Black (City of Cambridge), Kate Bubriski (Arrowstreet), Shannon Kaplan (InPosse), Samuel Lasky (William Rawn Associates) I

Integrated Design for High Performance Schools

Harborview 1

Schools provide complex puzzles for the architects and engineers who engage them. In this panel discussion, two high performance firms and their construction and engineering partners will discuss the challenges and rewards of decision-making in an educational environment, and the value of a fully integrated design process. At the Proctor Academy, the new dining hall's energy target was Net Zero. The complex load profile – especially the all-electric kitchen and its extensive make-up air requirements, presented the design team with a hefty challenge. At the Friends School of Portland, architect and builder engaged with the school's building committee to create a building to embrace the community's values of simplicity, integrity and stewardship, and managed to deliver Maine's first Passive House school building.

Phil Kaplan (Kaplan Thompson Architects), Bill Maclay & Megan Nedzinski (Maclay Architects), Andy Shapiro (Energy Balance, Inc.), Peter Warren (Warren Construction Group, LLC) | D

Lightning in a Bottle II: Energy Storage Applications, Business Models and Case Studies

Harborview 2

Energy storage technologies are receiving a great deal of attention and investment. This second of two sessions will take a closer look at energy storage applications, business models, case examples, and project development considerations in the Northeast region and nationally. What technologies are being deployed now, under what business models, and what circumstances make sense technically and economically for your project? We will describe energy storage applications for grid support, peak shifting and load leveling, renewable energy integration, microgrids and resilience, and aggregations for demand response. We will consider how energy storage might apply to your projects, clients and communities, and explore value streams and business models for energy storage deployment including third party ownership and power purchase agreements.

Evan Berger (Calmac Manufacturing Corporation), Scott Daniels (Schneider Electric), Chris Lotspeich (Celtic Energy, Inc.), Betty Watson (SolarCity) | P R

Passiv for the Masses

Waterfront 2

Climate change has made mainstream adoption of high-performance buildings a priority, and the Passivhaus standard provides a means to assess and drive the performance of these buildings. With 16 certified Passivhaus buildings between them, industry leaders

Adam Cohen, Alan Gibson, and Mathew O'Malia will discuss their experiences designing and constructing a wide spectrum of building types, styles and scales that meet the Passivhaus standard. Adam Cohen will discuss techniques used to design, manufacture and construct Passivhaus buildings that cost the same or less than comparable code buildings. Alan Gibson will talk about simplifying construction systems and assemblies, and lessons learned about structure, moisture, air sealing, and air quality. Mathew O'Malia will explore how to integrate Passivhaus parameters into the design process to create a new canon of architectural design. The presenters will use case studies including: single and multi-family homes, schools, university residence halls, and community buildings.

Adam Cohen (Passiv Science, LLC), Alan Gibson & Mathew O'Malia (G O Logic, LLC) | S I D M

Retrofit Like You Care About It: Inspiring Homeowners to Care about Efficiency

Cityview 1

You care about the environment, climate change and sustainability. You want to do your part to make existing homes more energy efficient. But all your customers want are new kitchens, better bathrooms and big additions. What can you do? How can you help homeowners learn to value what they can't see and begin to understand their house as a system? And equally important, how can you, on a limited budget, and in piecemeal fashion, move a house systematically toward greater energy efficiency? In this panel discussion, we'll cover the following: educating homeowners about energy efficiency and the house as a system; making a long-term plan for energy upgrades over time; working incrementally to improve a home's energy efficiency; and insuring that the way is clear for those who follow you.

Joe Carry (Decumanus Green Design/Build Inc.), Paul Eldrenkamp (Byggmeister, Inc.), Dan Kolbert (Kolbert Building), Heather Thompson (Thompson Johnson Woodworks), Jamie Wolf (Wolfworks, Inc.) | S E

The Challenges of Net Zero Energy When It's Bigger than a Breadbox

Cityview 2

Municipalities and other owners of large buildings are increasingly setting their sites on net-zero. This session will feature a case study of the 190,000sf Martin Luther King, Jr. School, the first of the Cambridge public schools to target NZE. Presenters will discuss the process, content and tools used at design workshops and user group meetings to gather, analyze, ideate and integrate information into design solutions while also facilitating cultural and behavioral change among users. They

will highlight the challenges and gritty details involved in shepherding both this project and others—including issues related to codes, daylighting, systems selection, load management, maintenance, and product selection. Attendees will learn what worked, what didn't, and why.

Rob Diemer (AKF Engineers, LLP), Jana Silsby (Perkins Eastman Architects) | D

The True Performance of Your Hidden HVAC Equipment

Waterfront 1

How well does central ventilation equipment actually perform? VEIC and CLEAResult have respectively conducted field monitoring of Roof Top Units in commercial/institutional buildings and central Energy Recovery Ventilators in multifamily buildings. The outcomes? Although in certain cases not as bad as one would predict, this equipment is often underperforming, neglected, misunderstood, and installed and/or operated incorrectly. Learn more about our findings, how to improve current performance, and alternative design ideas to do it differently next time.

Ethan Bellavance & Mary Jane Poynter (VEIC), Matt Root & Margo Valdes (CLEAResult) | L M

When You Come to a Fork, Take It. Residential Choices and Performance

Harborview 3

Decisions, decisions. Residential design is always part education, part therapy, and part architecture. This panel will showcase the work of two designers and a builder who have climbed high on the residential decision-making tree. Architect Chris Briley will explore the challenges of two Passive House projects, in the same climate, with different clients, as he worked with each to come to different conclusions and different strategies for the same high performance target. Jesse Selman and Kent Hicks (architect and builder) will discuss the complex process of navigating the sometimes conflicting goals of high performance, thoughtful design, and the needs of a client with an existing building, a beautiful site, and multiple chemical sensitivities.

Chris Briley (Briburn), Kent Hicks (Kent Hicks Construction Company), Jesse Selman & Andrew Webster (C & H Architects) | S E D

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THURSDAY SESSIONS

OPENING PLENARY

8:30 - 10am

Opening Plenary: Key Challenges and Opportunities of Our Times, Part II Plenary Space/Trade Show Floor

As NESEA leads the charge to create low-energy buildings and transition to renewables, we must also grapple with the broader implications of how we build and power our buildings: What are the health impacts of our material choices? What is the role of big data in advancing efficiency? How do our building practices influence our sense of community connection? How do we balance building scale approaches to climate change with community and regional scale approaches? In this two-part plenary, internationally renowned thought leaders share their cross-disciplinary work to address energy, climate change, and environmental challenges that go beyond energy. Free with conference or trade show pass. **Frances Moore Lappe (Small Planet Institute), Bill Walsh (Healthy Building Network), Barun Singh (WegoWise)**

SESSION 1

10:30am - 12pm

Air Leakage: What You See is Not What You Get*

North End

Air leakage is an important consideration in all construction. Tighter buildings are more energy efficient and comfortable. Although large buildings are rarely blower door tested, architects, enclosure consultants, manufacturers, and installers spend time and money to provide air tight buildings. Details within the contract documents and subsequent shop drawings indicate the intended location of the air barrier. However, over the course of mockup construction, mockup testing, and project construction, air leakage issues often arise that were not addressed prior, generally at unusual conditions and transitions. These locations can be difficult to detail and are often overlooked. This presentation will first review the basics of air leakage detailing, and then provide specific examples where project documentation did not address air leakage sites found in the field. Implemented field fixes will also be presented. Although project-specific, these case studies will demonstrate typical locations that must be carefully vetted during detailing. *Limited seating

Hannah Durschlag (Vidaris, Inc.) | E

Developing the World's Biggest Passive House at Cornell Tech Skyline

Cornell University is developing a satellite campus in New York City called Cornell Tech,

whose academic curriculum will focus on the disciplines of science including engineering and new technology. So it's fitting that the campus will house what is currently slated to be the tallest and biggest passive house in the world, a multifamily tower that will serve as student and faculty housing in 2017. Come hear from members of the design and development team behind the 27-story, 350 unit project, which broke ground in June 2015, to learn how they were able to design to the passive house standard on such a large scale, and how they plan to build it. Will include detailed information on costs and specific system upgrades.

Lois Arena (Steven Winter Associates), Luke Falk (Related Companies), Deborah Moelis (Handel Architects), Arianna Sacks Rosenberg (The Hudson Companies, Inc.)

Highways, Health, and Energy: From City Planning to Air Filtration*

South End

This session will be a workshop focused on design and refinement of strategies to reduce the exposure to traffic-related pollution for people who live and attend school in buildings that are near high-traffic roadways. The presenters will provide an introduction to the scientific research around health and pollution exposure, especially relating to Ultra Fine particulate pollution, as well as providing some initial findings around using building siting and air filtration as effective mitigation strategies. Attendees will be asked to help design and refine more effective strategies for keeping people healthy near highways. There are major questions around how best to filter indoor air in residential settings, how to protect students in active outdoor play, and how to use walls and buildings to shield people from the pollution coming from high-traffic roadways.

*Limited seating

Doug Brugge (Tufts University), Jim Newman (Linnean Solutions), Wig Zamore (Somerville Transportation Equity Project) | C

Northeast Solar Policy: What's Coming Cambridge Complex

Solar policies continue to evolve at breakneck pace, making it challenging to keep on top of all of the latest. Which types of proposals are likely to catch on and drive the industry as it progresses towards maturity? How will solar policies interact with pushes for grid modernization? This session will provide a quick update on the latest in the states with major changes and then a discussion on what three engaged solar policy experts consider the most interesting developments we'll see in the next year or two (good or bad). We'll also discuss lessons learned in the last couple years. Come listen in as three of the brightest in the industry push back and engage on the most

interesting issues in solar.

Mark LeBel & Leslie Malone (Acadia Center), Nathan Phelps (Vote Solar), Karl Rabago (Pace Energy and Climate Center) | P R

Offsite Construction: The Future? Beacon Hill Complex 1

A panel of architects and manufacturers steeped in the offsite construction industry will discuss the future of offsite construction. Topics include the stigma of the industry itself in the US versus widespread successes overseas, challenges of the process within our current system, the truth behind perceived cost/speed/quality advantages, and the frank and current reality of it all.

Bill Aylor (Lake|Flako Architects), Tedd Benson (Bensonwood + Unity Homes), Andrew Dey (Andrew Dey Consulting), Bryan Huot (Preferred Building Systems), Phil Kaplan (Kaplan Thompson Architects), Geoffrey Warner (Alchemy Architects)

| D B

Roofs: Research and Reality Cityview 1

To vent or not to vent? To insulate outboard or inboard? To provide details or just let contractors wing it? These are some of the questions two pros, who spend a good portion of their work days crawling around on roofs (of both wood framed and masonry buildings), will address. They will share case studies of roof failures; go over edge and penetration details that are so critical for long-term durability; discuss how to take advantage of opportunities to improve thermal performance; and share some of the latest geeky research, including how to do an unvented assembly without code-mandated spray foam. You'll leave this session knowing what works, what doesn't, and how to juggle budgetary, design or building constraints to build durable, low-risk roofs.

Peter Marciano (Fluid Technologies), Kohta Ueno (Building Science Corporation) | S E M

What Contractors Need to Know About Spray Foam

Beacon Hill Complex 2 and 3

Spray foam is an essential tool in the high performance building toolbox, yet many builders have concerns about using the material including subpar installations; how to protect workers, occupants and spaces outside the spray zone; offgassing; the global warming potential of blowing agents, and even foam failures. In this session, Henri Fennell, a leading spray foam expert with more than 40 years of experience, will discuss what contractors need to know and to do to ensure safe, high quality installations. Common problems will be addressed as well as strategies for avoiding them. The session will conclude with an extended Q&A, so attendees are encouraged to come with questions.

Henri Fennell (H C Fennell Consulting, LLC) Kerry Koskinen (RetroFuture Remodeling) | E

When Does Smaller Scale Cogeneration Make Sense?*

Washington

Cogeneration or combined heat and power (CHP) can provide cost-effective power, heating, and cooling, reduced emissions, lower costs, and energy surety—under the right conditions. But how do we know whether CHP might be a good fit for residences, commercial buildings and multifamily housing relative to large facilities, campuses and urban districts? Can existing central utility plants be upgraded to cogeneration? Is third party financing, ownership and operation an option? Hear from experienced CHP designers and installers who will provide an overview of smaller-scale CHP technologies and applications, describe the elements of feasibility assessment for CHP in new construction and retrofits, and offer examples of installations and business models for various scales of CHP installations. *Limited seating

Matthew Dudley (Cape Light Compact), Greg Hester (Efficient By Design Engineering), Thomas Jacobsen (Blue Delta Energy), Chris Lotspeich (Celtic Energy, Inc.) R

SESSION 2

1:30 - 2:30pm

Achieving Zero Net Energy Affordably Today: Mobile Home Replacement Cityview 2

A modular home factory in Wilder, VT has opened to build zero-net energy mobile home replacement units. While there have been other efforts to replace mobile homes outside Vermont, they have done so with newer manufactured housing units that suffer from poor indoor air quality, high energy costs, and durability issues. This session will provide an overview of the issues with manufactured and mobile homes including financing and depreciation, attributes of the zero-net energy replacement modular home, the design and build process, and the comprehensive whole-house monitoring system. Detailed monitored energy and environmental data will be shared from two years of occupancy. The session will also discuss design challenges/constraints

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associated with cost, prefabrication, and transportation of a Modular/mobile home. We will present a comparative look at cost and energy with other related housing initiatives, as well as show the cost to benefit analysis of what it would take to bring the project to the Passive House level.

David Pill (Pill-Maharam Architects), Peter Schneider (Vermont Energy Investment Corporation) S D B

Core Principles: Sustainability in Your Practice*

North End

The terms “sustainability” and “resilience” drive us to address a bigger, long term picture while managing the details at hand. The skills needed to accomplish this feat of ever-changing perspective are applicable to project work as well as to your own career development. The complex puzzle includes budget, program, existing mandates, ambitious goals, experiences and team temperaments and more. Learn how to ingrain sustainability in your practice and personal work approaches from Jodi Smits Anderson, Architect and Director of Sustainability Programs at DASNY, the NY State Construction and Public Finance Authority, and Jim D’Aloisio, Principal at Klepper, Hahn & Hyatt. *Limited seating

Drivers, Trends, and Tools for Healthier Materials Selection

Cambridge Complex

This session will educate participants on drivers, tools, and trends for healthier materials selection. As LEED v4 and the Living Building Challenge’s Materials Petal become mainstream, designers are starting to focus on material’s environmental and human health impacts. In the past, “green” materials were simply defined by physical attributes: the amount of recycled and regional content, allowable VOC’s, etc. Because we are now tasked with demonstrating optimization across the entire supply chain, tools and practices which facilitate “transparency” and maximize designers’ decision making capabilities are emerging. This presentation will introduce the following: Red Lists, Environmental Product Declarations (EPD’s), Health Product Declarations (HPD’s), and extended producer responsibility. Our panel experts include a manufacturer which is promoting these tools and finding many benefits through their supply chain optimization, as well as local practitioners who are developing the tools and guiding their implementation.

Blake Jackson (Tsoi/Kobus & Associates), Aaron Smith (ASSA ABLOY Door Security Solutions), Bill Walsh (Healthy Building Network) P B

Instructions NOT Included: Lessons Learned Operating Zero Net Energy Beacon Hill Complex 1

In May of 2011, TD Bank opened the first zero net energy bank in the United States. The LEED Platinum certified store, which is located in Ft Lauderdale, FL, achieved net zero operations in 2012, but missed it in the last month of 2013 by just 1,845 kWh. Net zero operations were again achieved in 2014 due to the project team and an aggressive monitoring process put in place to ensure net zero status would NEVER be missed again. We are ready to share the good along with the less than good... Can a coffee maker really cause you to miss your energy consumption target? We’ll answer that with REAL DATA from our measurement and verification reports and show how TD and CBRE, the facility management partner, used the M&V information to drive operations. Hear what we learned at the outset of the project about the design and construction process, what that prevented us from achieving net zero operations in year 2, and how we resolved the problems to ensure success in year 3 and beyond. You’ll leave this session with specific actions you can implement immediately to improve energy performance, as well as team dynamics. This presentation is NOT just for net zero projects but for ANY PROJECT seeking to reduce energy consumption and have a highly functional facility management partnership.

Dave Del Rossi & Jackie Henke (TD Bank), Marianne Larrisey (CBRE) I

O&M Stories in MF Housing: Challenges, Solutions & Results Skyline

In the world of multi-family housing every operational dollar is earmarked, budgeted, and designated. For both Selfhelp Community Services, owning/operating 960 units, and POAH, owning/operating 8500 units, this rings especially true. Both organizations have worked to create operational plans and protocol, short and long term goals to reduce energy spending, and have thought creatively about how to manage, track, and create change within their organizations. With technical assistance to support both organizations and build capacity, they have telling results, some failed experiments, and also successful solutions that are working well to save energy and reduce costs. In this session you will hear how both organizations tackled similar hardships; how they reduced energy and water spend with little upfront capital. Both organizations learned how to use data to monitor and understand consumption, and expanded their capacity for energy and water management through systems, trainings and drawing on technical experts where needed.

Julie Klump (POAH), Samantha Schoenberger (Selfhelp Community Services), Sam Weissenberg (Bright Power, Inc) M

THURSDAY SESSIONS

SESSION 2 CONTINUED

1:30 - 2:30pm

Sticky Business: The Truth About Tapes and What It Means for Your Enclosure

Beacon Hill Complex 2 and 3

Pressure sensitive tapes can make or break the continuity of your air and weather barrier—ensuring a durable, high performing enclosure, or putting it at risk. Yet we have little way of knowing whether tapes will stand the test of time. We can't visually inspect them once the cladding goes up. Nor can we rely on existing testing standards, which aren't suitable for the products used in construction and the cold, windy, wet, dirty conditions in which they are installed. Three years ago Peter and Dave took matters in to their own hands, setting up a testing facility to measure the performance of routinely installed products under field conditions. See the results of their testing and what it means for field practitioners.

Dave Gauthier (SmartHomze/Vantem Panels), Peter Yost (BuildingGreen, Inc.) E

The Future of Net Zero Energy Cityview 1

Net Zero Energy Buildings have reaching a tipping point. The economic limitations that restricted their success in the past have changed drastically and the technologies needed to achieve Net Zero Energy are now readily available. This session will uncover the strategies and technologies used and the policies and programs in place that are accelerating the uptake of Net Zero Energy Buildings and Communities. This session will also highlight inspiring case studies including project teams' motivation for pursuing Net Zero Energy Building Certification, how they achieved it and how they maintain performance over time. Brad Liljequist, Technical Director of the Net Zero Energy Program of the Living Building Challenge, will discuss the trends emerging in Net Zero Energy and how each participant can take the lessons learned into their own practice.

Brad Liljequist (Net Zero Energy and Living Community Programs) P C B

The Lighting Consumer's Conundrum* South End

The LED revolution has come a long way, and options for the retail consumer are hugely

improved in just the past two years. There are now many models of high-efficiency residential fixtures, and many models of screw-in LEDs exceed the efficiency of CFLs. However, there are still bad choices, including many of the least expensive models. Often, "it's just a light bulb!" and who can offer the needed guidance to get through this perplexity? Is it from the retail aisle, the energy auditor, the manufacturer, from the government? Hear some of the folks working to provide solutions, and decide for yourself! *Limited seating
Fred Davis (Fred Davis Corporation), Taylor Jantz-Sell (EPA), Jim Yorgey (Lutron) L

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Whole Property Retrofit: Redesigning Suburbia for an Uncertain Energy & Food Future*

Washington

How do we turn the “problem” of suburbia into an enormous opportunity to create a set of resilient systems that can adapt to a changing world? Learn how a holistic design process and a whole-property retrofit in Maine has created a suburban model of living that requires significantly less time, money and energy to run while simultaneously enhancing the thermal comfort and well-being of the residents. This case study presents a transferable suite of findings on efficiency, renewables, integrated landscape elements, food production, transportation and “incremental deep energy retrofiting” which have weaned this eighty-year-old home completely off of fossil fuels. *Limited seating
Lisa Fernandes (The Resilience Hub) S C B

SESSION 3

3 - 4pm

A Prototype Visualization Tool for Hygrothermal Analysis*

North End

Recent developments in the field of building simulation and computing power are allowing architects to effectively move performance analysis of designs into the early stages of the design process. These developments aim to allow for the rapid iteration of design solutions that examine various performance criteria. Learn about a prototype tool that can serve as a platform to merge large amounts of building performance simulation data coupling various performance criteria. A case study using the prototype tool that uses WUFI engine to simulate moisture movement and analyze the related risk for mold growth and for building component failure using ASHRAE standards. The conclusions show that key insights can be quickly obtained using this tool, demonstrating its potential to increase our understanding of building performance. It also lays the groundwork for a more seamless integration of hygrothermal modeling into the whole building analysis process.* Limited seating

Vamshi Gooje & Mathew Naugle (Thornton Tomasetti) E D

Foam-Free: Fabulous, Feasible, & Fun!

Cityview 2

Three experienced practitioners will demonstrate that we needn't be captive to foam in the high performance building industry by showing practical solutions that eliminate foam in new and retrofit applications – above and below grade. Using real projects and assemblies, the speakers will discuss an integrated design build process, review the implementation of details and sequencing

and the verification and commissioning of alternative construction methods. Without dwelling on the negative environmental impacts of foam insulations, alternative, safer insulation materials will be identified with lower embodied toxicity, energy and GWP.
Carri Beer (Brennan+Company Architects), Jacob Deva Racusin (New Frameworks Natural Building, LLC), Michael Hindle (Passive to Positive) I D M

Home Performance Insights from Big Data at NEST

Cityview 1

Connected devices like the Nest Learning Thermostat provide an unprecedented amount of data about home energy usage patterns. This data can be used to further our understanding of how homes really work, and to help us identify both opportunities for and barriers to improving home performance. This session will present insights gleaned from analyzing large-scale anonymized data collected by Nest thermostats, and discuss the significance of these insights for the home performance industry. Topics to be addressed include: variations in HVAC run times with weather, real-world sizing of heating and cooling equipment, indoor temperature and humidity variations by season, and heat pump performance characteristics.

Michael Blasnik (Blasnik and Associates) S M

Living Building Challenge: Historic Building, Modern Lessons

Skyline

The Living Building Challenge (LBC) can be applied to any building project, including historic renovation and new construction. Charley Stevenson and John Rahill will compare and contrast the LBC renovation of an 18th century plank building to the design and construction of several new LBC buildings. By examining the three most challenging petals (water, energy and materials) they will illuminate the benefits of and the obstacles to LBC compliance. Particular attention will be paid to the balance of envelope performance and renewable energy, and to the palette of materials that meet the LBC Red List.

John Rahill (Black River Design), Charley Stevenson (Integrated Eco Strategy) S C D M

Mainstreaming Resilience: Making Resilient Design Standard Practice

Beacon Hill Complex 1

While few argue about the importance of resilience in an age of climate change (with more intense storms, rising sea levels, more frequent drought, and worsening heat waves), there remains little focus on resilient design in building codes, zoning bylaws, and voluntary building rating systems, such as Passive House, Living Building Challenge, and LEED. In this interactive session, the presenters will lead a discussion about how to make resilient design more of a mainstream focus. They will report

on inherent resilience aspects of Passive House, recent changes to the Living Building Challenge that address resilience, and new LEED pilot credits.

Alex Wilson (BuildingGreen, Inc.) P D

Pricing Sustainability: What Electricity Rate Design Means for the Future of Solar and Efficiency

Cambridge Complex

In recent years, increasing levels of distributed generation have led to challenging questions about how utilities charge customers for the electricity they use. To date, this has largely been a debate between utilities and distributed solar industry and advocates, but the potential impact on energy efficiency is enormous. The session will take a close look at proposed reforms in electric rate design, show how they could change the economics of consumer investments in residential energy efficiency, and recommend what works best for the modern energy consumer. A key topic will be the trend among utilities to increase fixed fees, also known as customer service charges, to levels that impair consumer control over energy costs and disrupt energy efficiency. Also spotlighted will be legislation passed in Connecticut that established a pro-consumer definition of the fixed fee and how that approach might translate to other states in the region. Overall, this session will present a concrete vision for how grid reform can accelerate, not impede, progress on making our buildings highly-energy efficient.

William Dornbos & Jamie Howland (Acadia Center), Danny Musher (University of Rhode Island) P R

Room-side Low-e Coating: As Good As It Sounds?*

Washington

The selection of a glazing type for a project is based on factors like thermal performance, impact on occupant thermal comfort and cost. Double pane glazing units with a room-side low-e coating are becoming popular, because their thermal properties and visual appearance are comparable to those of a triple pane unit, but at a lower cost. However, the impact of selecting one over the other can have significant impact on seasonal thermal comfort conditions, and the wrong choice could lead to a need for perimeter heating as a remedial measure. Learn about benefits and drawbacks of using double pane glass with a room-side low emissivity coating as a substitute to a more expensive and heavier triple pane unit. In order to ensure no perimeter heating is necessary with either unit, we introduce a method to quantify two factors affecting occupant thermal comfort: radiant temperatures and risk of downdraft. *Limited seating

Vera Baranova, Alejandra Menchaca & Lynn Petermann (Payette Associates Inc.) I E