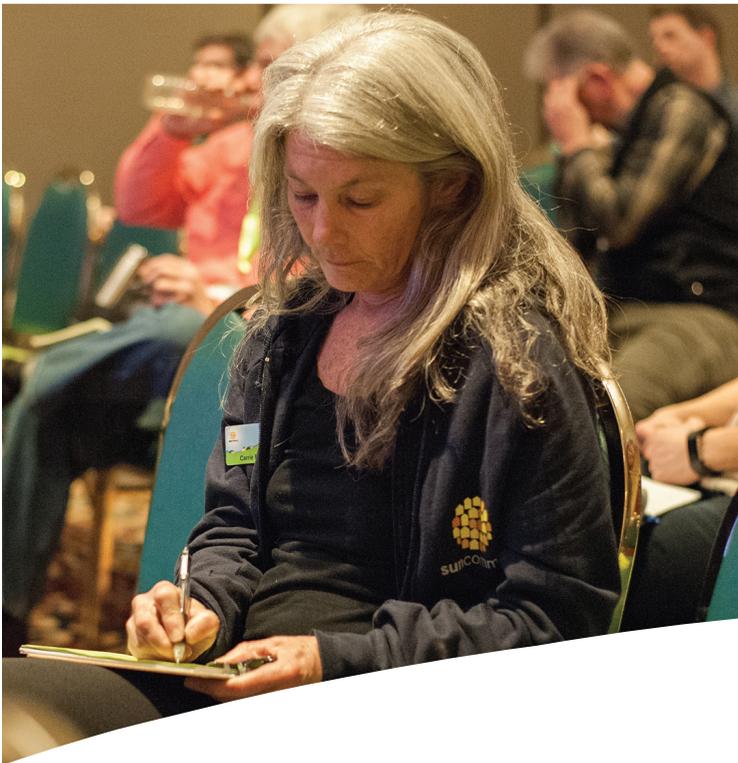


Program

February 6 & 7, 2019
DoubleTree by Hilton Hotel
South Burlington, VT



2019 Theme:
Affordable
Efficiency



Efficiency Vermont's 2017 Value



139,376 MWh saved
The electricity it takes
to power 14,538 homes
for a year



201,836 MMBtu saved
The fuel it takes
to heat 2,191 homes
for a year

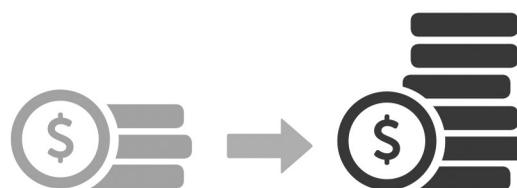


\$182.8 million saved by Vermonters

The amount Vermonters will save in energy and water costs over the lifetime of their 2017 investments in efficient equipment and building improvements

Avoided pollutants

820,000 U.S. tons
Carbon dioxide
374.9 U.S. tons
Nitrogen oxides
306.3 U.S. tons
Sulfur oxides



Every **\$1** invested in
efficiency = **\$2** saved¹

¹ Investments are Efficiency Vermont's and participants' 2017 costs. Savings are participants' lifetime savings from 2017 investments.



Contents

- Welcome 4
- Agenda 5
- Workshop Schedule 6
- Workshop Descriptions..... 8
- Keynote..... 17
- Presenters 17
- Best of the Best Award Winners 29
- Exhibitors & Sponsors..... 32
- Hotel Floor Plan 42
- Exhibit Hall Floor Plan 43
- Thanks to Our Sponsors back cover





Where can you find nearly 1,000 experts on building durability and energy efficiency? At Better Buildings by Design. This annual not-for-profit conference sponsored by Efficiency Vermont brings together top talent in building technology and design from across the country, and helps keep Vermont-area professionals at the forefront of their fields.

ZEM On Tour

Where: Directly outside the Conference Center entrance

When: Wednesday and Thursday, 7:30 am–6:00 pm (Efficiency Vermont staff will be on hand to answer questions 7:30–9:00 am, during lunch, and 5:00–6:00 pm)

Ever wondered how healthy, comfortable, and resilient a new home could be? Efficiency Vermont is bringing the traveling Zero Energy Modular (ZEM) model home to Better Buildings by Design. Come tour an all-electric ZEM home that makes as much energy as it uses, see solar and battery storage in action, and learn about associated affordable housing opportunities here in Vermont. The model home features a ramp for accessibility.

Welcome

Welcome to Better Buildings by Design 2019, the region's premier building industry conference!

This year's theme is "Affordable Efficiency." Creating affordable and energy-efficient buildings and homes is always a challenging task. Reconciling efficiency and cost-effectiveness is crucial for competitive business and meeting goals related to mitigation of climate change. Over the next two days, 40-plus workshops will be offered in which you'll learn about success stories, visions for the future, and strategies for overcoming barriers to affordable efficiency.

This year's conference kicks off at 8:30 am on Wednesday, February 6, with the keynote address from Ruth Ann Norton of Green & Healthy Homes Initiative.

The workshops that follow will be in five learning tracks: Building Systems, Business Support, Commercial, Envelope, and Integrated Design. A sampling of workshops: "Smart Home or Smart Homeowner?" "Financing Clean Energy in Vermont," "How to Implement Demand Control Ventilation and Comply with ASHRAE Standards," "Rethinking the Rules on Minimum Foam Thickness," and "Your Next Breakthrough—Efficient Emerging Technologies for Your Home and Business." Many of the sessions carry continuing education credits from AIA, ASHRAE, and BPI, among other organizations. In the exhibit hall, attendees can speak with more than 60 exhibitors and sponsors displaying the latest commercial and residential building products, technologies, and services. Discover cutting-edge techniques, materials, equipment, and systems for superior building performance, energy efficiency, and indoor air quality.

Award-winning design and construction on display

Winners of Efficiency Vermont's 2019 Best of the Best Awards in residential and commercial construction and the Efficiency Excellence Network will be recognized, and posters of the award winners will be on display throughout the conference.

General public welcome

In addition to the morning keynote, the public is invited and encouraged to attend the Wednesday reception beginning at 4:45 pm. As the largest gathering of building professionals in the Vermont region, Better Buildings by Design is the place to make connections, investigate new practices and technologies, and begin planning any building or renovation project for 2019.

Questions?

We're just a few steps away at the Efficiency Vermont booth, located outside the main exhibit hall.

 Follow us! Better Buildings by Design 2019 on Twitter. #BBD19

Agenda

Wednesday, February 6

7:00 am	Exhibit Hall opens for registration and breakfast (Breakfast sponsored by Parksite)	
8:30–10:00	Opening Session: Emerald Ballroom	Welcome 2019 Efficiency Vermont Awards Keynote Address by Ruth Ann Norton
10:00–11:50	EEN One-on-One Marketing and Lead Generation Coaching in Willsboro Room (open to EEN members only; advance registration required)	
10:00–10:20	Refreshment break in Lake Champlain Exhibit Hall	
10:20–11:50	Workshops	
11:50–1:20 pm	Lunch in Lake Champlain Exhibit Hall & Petit Dejeuner (Lunch sponsored by Murphy's CELL-TECH LLC)	
11:50–1:20 pm	Blair Hamilton Scholarship Luncheon in 252 Tavern (Lunch sponsored by VEIC)	
12:15–1:00	Basecamp as a Means for Managing Information in Valcour Room	
12:15–12:45	EEN Overview Training in Willsboro Room*	
1:00–2:50	EEN One-on-One Marketing and Lead Generation Coaching (continued from morning)	
1:20–2:50	Workshops	
2:50–3:15	Refreshment break in Lake Champlain Exhibit Hall	
3:15–4:45	Workshops	
4:00–7:00	Exhibit Hall open to public	
4:45–7:00 pm	Evening reception in Lake Champlain Exhibit Hall— all welcome to attend (Reception sponsored by Daikin and Vermont Gas Systems)	

Exhibit Hall

Stop by the exhibit hall and talk with more than 60 exhibitors and sponsors displaying the latest residential and commercial building products and services. The exhibit hall is open to the public, free of charge, on Wednesday from 4:00 to 7:00 pm and Thursday from 1:30 to 3:30 pm. Beverages are available in the exhibit hall during scheduled breaks.

Basecamp as a Means for Managing Information

We all manage large amounts of data with each job we do. This talk will focus on a cloud-based program called Basecamp and its approach to managing this information. Basecamp is a program that allows you, and whoever else you choose, to be part of an open (and closed to some) platform for discussions, file storage, scheduling, and task assignment. During the project the information is easily accessed, and updates are sent via email to those selected to be part of a discussion. Come see a demonstration of how we use this program, and some others, to keep the piles of paperwork at a minimum while maintaining a clear line of communication and a storage location that clients and subcontractors can access at any time after the project is complete. This will be an open format for audience input. The idea of this presentation is to share what we consider to be a seamless way to consolidate information for everyone on the project team.

Thursday, February 7

7:30 am	Exhibit Hall opens for registration and breakfast	
9:00–10:30	Workshops	
9:00–11:50	EEN One-on-One Marketing and Lead Generation Coaching in Willsboro Room	
10:30–11:00	Refreshment break in Lake Champlain Exhibit Hall	
11:00–12:30 pm	Workshops	
12:30–1:45	Lunch in Lake Champlain Exhibit Hall & Petit Dejeuner	
12:30–1:45	Blair Hamilton Scholarship Luncheon in 252 Tavern (Lunch sponsored by VEIC)	
12:30–1:00	EEN Overview Training in Willsboro Room*	
1:10–5:00	EEN One-on-One Marketing and Lead Generation Coaching (continued from morning)	
1:30–3:30	Exhibit Hall open to public	
1:45–3:15	Workshops	
3:15–3:30	Refreshment break in Lake Champlain Exhibit Hall	
3:30–5:00	Workshops	
3:30	Exhibit Hall closes, exhibitor tear down	
5:00 pm	Conference adjourns	

* This training satisfies the initial training requirement for EEN enrollment.

Workshops at-a-glance

DAY 1 • 10:20 AM–11:50 AM	DAY 1 • 1:20 PM–2:50 PM	DAY 1 • 3:15 PM–4:45 PM
<p> BUILDING SYSTEMS</p> <p>Am I Nothing Yet? Residential & Commercial Intermediate Emerald III</p> <hr/> <p>Light, Color, and Improved Color Quality Possibilities with LED Solutions Residential & Commercial Introductory Diamond I</p> <hr/> <p> INTEGRATED DESIGN</p> <p>Factory-Built, High-Performance and Affordable Homes: Notes from the Field Residential Intermediate Emerald I</p> <hr/> <p>Healthy Homes Are Here to Stay Residential Introductory Diamond II</p> <hr/> <p>How Small, How Inexpensive, Can an Energy-Efficient House Be? Residential Intermediate Emerald II</p> <hr/> <p> BUSINESS SUPPORT</p> <p>Financing Clean Energy in Vermont: A Market Snapshot and Discussion Residential & Commercial Intermediate Amphitheatre</p>	<p> INTEGRATED DESIGN</p> <p>Green River Commons, an Affordable Net-Zero Ready Development Residential Introductory Emerald III</p> <hr/> <p> BUSINESS SUPPORT</p> <p>Vermont's New 2019 "Commercial Building Energy Standards" Energy Code Commercial Intermediate Amphitheatre</p> <hr/> <p> COMMERCIAL</p> <p>Benefits of a Large-Scale Monitoring Based Commissioning Program in the State of Kentucky Commercial Intermediate Diamond I</p> <hr/> <p>How to Implement Demand Control Ventilation and Comply with ASHRAE Standards Commercial Intermediate Emerald I</p> <hr/> <p>Stealth Passive House: Boring, Invisible, and Everywhere Commercial Intermediate Emerald II</p> <hr/> <p> ENVELOPE</p> <p>Large Building Enclosure Commissioning: What Works in Wall Assemblies Residential & Commercial Intermediate Diamond II</p>	<p> BUILDING SYSTEMS</p> <p>Elm Place: Post-Occupancy—Solving the Data Puzzle Residential & Commercial Intermediate Amphitheatre</p> <hr/> <p> INTEGRATED DESIGN</p> <p>Advanced Wood Heat in Highly Efficient Buildings Residential & Commercial Intermediate Emerald II</p> <hr/> <p> BUSINESS SUPPORT</p> <p>A Year of Massive Change in Digital Marketing: Understanding the New Online Advertising Landscape—Facebook, Local Services Ads, Google Ads, Purchased Leads, Reviews, and More Residential Introductory Diamond II</p> <hr/> <p> COMMERCIAL</p> <p>Commissioning, Operating, and Maintaining Air-to-Air Energy Recovery Systems Commercial Advanced Emerald I</p> <hr/> <p>Tier 3 Statewide Total Energy Program: One of Vermont's Most Effective Climate Protection Strategies Residential & Commercial Intermediate Diamond I</p> <hr/> <p> ENVELOPE</p> <p>Beyond CFM50: Blower Door Diagnostics Residential & Commercial Intermediate Emerald III</p>

DAY 2 • 9:00 AM–10:30 AM	DAY 2 • 11:00 AM–12:30 PM	DAY 2 • 1:45 PM–3:15 PM	DAY 2 • 3:30 PM–5:00 PM
<p> BUILDING SYSTEMS</p> <p>Lessons Learned with Biomass Heating Systems (extended session) Residential & Commercial Intermediate Emerald II</p> <hr/> <p>Making Building Systems Sing in Harmony: Retrocommissioning in Vermont Commercial Intermediate Diamond I</p> <hr/> <p>Smart Home or Smart Homeowner? Residential Introductory Diamond II</p> <hr/> <p>Starving for Darkness: How Exterior Lighting Affects Our Wildlife Residential & Commercial Intermediate Amphitheatre</p> <hr/> <p> COMMERCIAL</p> <p>High Performance, Affordability, and Efficiency in High-Ventilation Buildings: The UVM STEM Complex Commercial Intermediate Emerald I</p> <hr/> <p> ENVELOPE</p> <p>Rethinking the Rules on Minimum Foam Thickness Residential Advanced Emerald III</p>	<p>Carbon-Based Life Forms Creating Carbon-Free Buildings Residential & Commercial Intermediate Emerald III</p> <hr/> <p> INTEGRATED DESIGN</p> <p>Your Next Breakthrough—Efficient Emerging Technologies for Your Home and Business Residential & Commercial Introductory Emerald I</p> <hr/> <p> BUSINESS SUPPORT</p> <p>Affordable and Profitable: An Oxymoron? We Don't Think So! Residential & Commercial Introductory Diamond I</p> <hr/> <p>Vermont's New 2019 "Residential Building Energy Standards" Energy Code Residential Intermediate Amphitheatre</p> <hr/> <p> COMMERCIAL</p> <p>The Value of Flexible Demand and Storage: Aligning Building and Grid Efficiencies Commercial Intermediate Diamond II</p>	<p> BUILDING SYSTEMS</p> <p>Hands-On Air Sealing and Basement Insulation Skills Residential & Commercial Intermediate Emerald III</p> <hr/> <p> INTEGRATED DESIGN</p> <p>Building for "Forever": High-Performance Design for Everyone Residential Introductory Emerald II</p> <hr/> <p>Evaluating What Matters Most: Revisiting Design to Meet Budgets and Keep the Dream Alive Residential Introductory Diamond II</p> <hr/> <p>Testimonials from an Affordable Housing Developer and Her Consultants Residential & Commercial Intermediate Emerald I</p> <hr/> <p> COMMERCIAL</p> <p>The Mechanical Aspects of "Practical Green" Commercial Buildings Commercial Advanced Diamond I</p> <hr/> <p> ENVELOPE</p> <p>Utilizing Insulated Concrete Forms (ICFs) to Achieve Affordable Efficiency for Residential and Commercial Multistory Buildings Residential & Commercial Advanced Amphitheatre</p>	<p> BUILDING SYSTEMS</p> <p>Energy Improvements in Public Purpose Buildings: PPESCO Case Studies Residential & Commercial Intermediate Diamond I</p> <hr/> <p>The New Wave of State Appliance and Lighting Energy Efficiency Standards Residential & Commercial Intermediate Diamond II</p> <hr/> <p> ENVELOPE</p> <p>A Vapor-Open Airtight Wall Assembly That Improves the Drying of the Envelope Residential Introductory Amphitheatre</p> <hr/> <p>Affordable Multifamily Housing: Net Zero and Passive House? Challenges, Opportunities, Mistakes, and Solutions Residential & Commercial Intermediate Emerald III</p> <hr/> <p>Beyond Energy Efficiency—Why Embodied Carbon in Materials Matters Residential & Commercial Intermediate Emerald I</p> <hr/> <p>Meeting the Passive House Airtightness Standard in a Historic Downtown Building Residential & Commercial Intermediate Emerald II</p>

Workshops

DAY 1: FEBRUARY 6, 2019

10:20 AM–11:50 AM CONCURRENT WORKSHOPS

Am I Nothing Yet? R & C / Intermediate EMERALD III

David Keefe, Efficiency Vermont

What is net zero? It's simple in concept, but complicated in details. Can a house that uses a gas kitchen stove ever be net zero? If you send to the grid an amount of electricity equal to the on-site gas use, does that change things? What about a house that uses wood for a portion of the space heat? Should we be talking about net-zero buildings or net-zero properties? Does the gas for the lawn mower matter? If we build a low-energy home out in the boonies, should transportation be considered in the equation? What about net-zero people, or net-zero households? Is zero an exact sum or a round number? If you're trying to get your house/property/family/life to net zero, how do you know when you get there? Participants are advised that the presenter doesn't really know the answers to these questions, but has some ideas. Attendees should bring their own ideas to the session, especially if they feel strongly about them, and perhaps together some progress can be made toward answering them.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Factory-Built, High-Performance and Affordable Homes: Notes from the Field R / Intermediate EMERALD I

Peter Schneider, Vermont Energy Investment Corporation

Over seven years ago, Tropical Storm Irene rolled through Vermont and disproportionately impacted owners of mobile and manufactured homes. In its aftermath, many stakeholders, such as the State, UVM, affordable housing organizations, and Efficiency Vermont came together to evaluate how to rebuild, which resulted in Vermont's Zero Energy Modular (ZEM) initiative. Five years after delivering the first ZEM home, we'll look at the progress made to date, lessons learned, and opportunities and challenges as we move forward. Attendees can anticipate a detailed overview of the construction, delivery, and setup of a ZEM home and monitoring systems, and the resulting post-occupancy data assessing energy, comfort, IAQ, and durability. Attendees will also have an opportunity for a personal tour of a ZEM home that will be sited at the conference.

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED

Financing Clean Energy in Vermont: A Market Snapshot and Discussion R & C / Intermediate AMPHITHEATRE

Gabrielle Stebbins, Energy Futures Group
Cheryl Fatnassi, Opportunities Credit Union
Russ Flanigan, Building Energy
Chris Kramer, Consultant

Clean energy projects—be they rooftop solar, a deep energy retrofit, an industrial process improvement, or an electric vehicle combined with a charging station—usually require a significant financial investment. What are the current financing offerings? Are they being used? What is working and what is not, in the clean energy finance marketplace in Vermont? Participants will learn what homeowners, businesses, and lenders think with an overview of the first Vermont Clean Energy Finance Report, followed by an audience discussion with a lender, clean energy finance expert, and installer. Attendees can weigh in on what they think is needed in Vermont in the clean energy finance toolbox to propel the state toward its "90% renewable by 2050" goal.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Healthy Homes Are Here to Stay R / Introductory DIAMOND II

Laura Capps, Efficiency Vermont
Brian Just, Vermont Energy Investment Corporation
Melanie Paskevich, NeighborWorks of Western Vermont

The concept of the healthy home is here to stay. But what precisely qualifies as a healthy home? Can it be achieved as part of renovations? What do homeowners gain from it? How can contractors promote it, and can they increase leads using health as a selling point? What are the latest developments in the link between buildings and health? Have builders and contractors been unknowingly making homes unhealthy? In this session, the presenters will begin with the basics of the healthy home. They'll cover three ongoing research projects in Vermont: two health and weatherization pilot programs taking place with regional hospitals, and a ventilation study that measures indoor air quality in the bedrooms of homes that have large differences in airtightness, ventilation systems, and heating systems. They will share key lessons learned from these efforts and suggest ways to prioritize and include health-based efficiency measures in the scope of contracting and design work, and how contractors should/can discuss with homeowners health conditions and expected health outcomes from performing health-based measures. Attendees will learn what local resources are available for support in this field and how to help customers reduce health triggers, select healthier materials, and make smart long-term design decisions.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

KEY TO WORKSHOP TRACKS

-  Building Systems
Sponsored by Energy Federation Inc. (EFI)
-  Integrated Design
-  Business Support
-  Commercial
-  Envelope
Sponsored by 475 High Performance Building Supply

R = Residential C = Commercial



801

Equipment suppliers



**How Small, How Inexpensive,
Can an Energy-Efficient House Be?**

R / Intermediate
EMERALD II

John Rahill and Polly Wheeler, Black River Design Architects

This session will discuss a project in East Montpelier, Vermont, that represents one example of balancing the often competing goals of low cost and high efficiency in designing a house for a client retiring to Vermont. His budget is tight, but he understands the economics of investing in energy efficiency. The 1,100-square-foot house utilizes the most proven economical energy-saving features, while the design creates a nice place to live. This session will discuss how the shape and size of a building impacts energy efficiency; how to balance investments in energy savings with energy generation (incremental energy modeling); and the importance of not losing sight of the goal of creating a nice place to live.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

**Light, Color, and Improved Color
Quality Possibilities with LED Solutions**

R & C / Introductory
DIAMOND I

Eric Haugaard, Cree Lighting
Brienne Willcock, Illuminart
Ron Gibbons, Virginia Tech Transportation Institute

Through the ongoing advancements of LED technology, the possibility of providing improved color quality performance and value has never been greater. This presentation will address aspects of color science and the basics of the human visual system. Included will be a review of the most widely adopted methods and metrics for describing all aspects of color quality and performance, for general illumination solutions. Considering both the indoor and outdoor environments, examples illustrating the current and future possibilities for accurately predicting color quality performance, color contrast, and layering of light and value in the illuminated space will be discussed, including the metrics incorporated in IES TM-30.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED, NCQLP

1:20 PM–2:50 PM CONCURRENT WORKSHOPS

**Benefits of a Large-Scale Monitoring
Based Commissioning Program
in the State of Kentucky**

C / Intermediate
DIAMOND I

Kevin Fuller and William Gnerre, Interval Data Systems

This presentation will cover the results of a four-year monitoring based commissioning and retrocommissioning program. The session will cover three aspects of the program: 1) collection of thousands of utility bills along with collection of more than 200,000 BAS trends from 170-plus buildings from six different control system manufacturers, 2) the results of analysis of more than 100 buildings identifying more than 700 energy conservation measures and remediation challenges, and 3) what Kentucky has learned from all the data and analysis and how it has changed the way the State works with the members of its facilities ecosystem, such as design engineers, control contractors, and commissioning agents. Time permitting, we'll show the data available through the system for the facilities organization.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

**Green River Commons, an Affordable
Net-Zero Ready Development**

R / Introductory
EMERALD III

Roger Cooney, Wright Builders, Inc.

This session will highlight recent work on lowering the cost for the purchase of a high-performance condo/home. There will be an overview of our public/private relationship, which helped make the project possible. We'll also cover the funding package(s) that made this mix of affordable and market rate units approachable for many. The presentation will include the benefits of designing and building an all-electric home with grid-tied photovoltaic panels and an overview of the building design and mechanical systems included in these buildings. We'll also share what we learned from our mistakes. Q & A during the session is welcome.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED



918

Contractor companies

How to Implement Demand Control Ventilation and Comply with ASHRAE Standards C / Intermediate
EMERALD I

Hoy R. Bohanon, Jr., Hoy Bohanon Engineering
ASHRAE standards 90.1 and 189P require demand control ventilation in some instances. ASHRAE standard 62.1 allows demand control ventilation but places restrictions on its application. Many existing installations do not comply with the requirements of ASHRAE Standard 62.1. What is required and what strategies and technologies can be used to meet the requirements of all the standards?

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED

Large Building Enclosure Commissioning: What Works in Wall Assemblies R & C / Intermediate
DIAMOND II

Frederick McKnight, Turner Building Science and Design, LLC
Large buildings present their own challenges with the wall and roof assemblies. A variety of components can be used to complete a wall or roof assembly, and the components usually come with complications in terms of ridges, valleys, multiple levels of roof, bump-outs, curtain walls, oblique angles, and many other features that all need to work together as an enclosure. The science, however, remains the same, and the critical values of how the assembly controls water, vapor migration, thermal energy transfer, and the migration of air all have to be addressed if builders are to have a successful enclosure. This presentation will look at some interesting wall and roof assemblies in which the components were assembled to meet the manufacturer's criteria without compromising the function of each component. The session will review a few real-life design challenges that were encountered during design review with respect to providing something that successfully incorporated all the requirements of a modern enclosure assembly.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Stealth Passive House: Boring, Invisible, and Everywhere C / Intermediate
EMERALD II

Jesse Thompson, Kaplan Thompson Architects
Early stage Passive House projects often launch with integrated teams, lots of fanfare, and extensive arrays of expensive consultants. That's all good for the pilot projects, but how do the rest of us take Passive House concepts to mainstream construction projects when we are not allowed all these special resources? This session will lay out the path followed by one architecture firm on several projects on which the Passive House standard was either frowned upon or actively off the table. What are the critical elements of Passive House that all building professionals need to ensure are maintained in every project, no matter the client goals or project situation?

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Vermont's New 2019 "Commercial Building Energy Standards" Energy Code C / Intermediate
AMPHITHEATRE

Keith Downes, Navigant Consulting
Eveline Killian, Cx Associates

Vermont's Comprehensive Energy Plan states that all new construction must be built to net-zero standards by 2030, but how will we get there? Between now and then, four cycles of code updates will progressively step Vermont along to meet the 2030 goal. That first step is expected to be adopted in early 2019 as the next version of Vermont's energy codes. This session will present the Commercial Building Energy Standards (CBES) updates for this most recent code cycle and will provide an update on the new code, highlight the changes from the current code, walk through the changes with the biggest impacts, and provide the information needed to ensure code compliance for future building projects. The presenters will also provide an update and information on the "stretch code."

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED

3:15 PM–4:45 PM CONCURRENT WORKSHOPS

A Year of Massive Change in Digital Marketing: Understanding the New Online Advertising Landscape—Facebook, Local Services Ads, Google Ads, Purchased Leads, Reviews, and More R / Introductory
DIAMOND II

Peter Troast, Energy Circle

In the last year, there have been massive changes in the digital advertising and lead generation landscape affecting home performance, HVAC, and efficiency contracting businesses. Google AdWords (pay per click) is an increasingly cost-effective lead generation source, but is growing in complexity. Google's new product—Local Services Ads—has been progressively rolling out across the country and will have a major impact on all searches related to HVAC and insulation. HomeAdvisor merged with Angie's List. Facebook, under pressure from privacy concerns, has significantly changed its targeting options. If there is one truism, it's that the digital marketing landscape is ever-changing. This session will cover everything attendees need to know about these recent changes, and how their company can take advantage of these new lead generation opportunities.

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED



\$6,528,554
Saved by low-income Vermonters over the lifetime of 2017 investments in their efficient equipment and buildings.

KEY TO WORKSHOP TRACKS

-  Building Systems
Sponsored by Energy Federation Inc. (EFI)
-  Integrated Design
-  Business Support
-  Commercial
-  Envelope
Sponsored by 475 High Performance Building Supply

R = Residential C = Commercial

Advanced Wood Heat in Highly Efficient Buildings R & C / Intermediate
EMERALD II

Juliette Juillerat and Adam Sherman,
Vermont Energy Investment Corporation
Emma Hanson,
Vermont Department of Forests, Parks and Recreation

Wood heating has been a cornerstone of heating buildings in Vermont for a very long time. In the past decade there have been significant advancements in wood heating technology—systems are now more efficient, cleaner, and highly automated. At the same time, building construction has improved dramatically—making envelopes tighter and considerably reducing demands for space heating and high output HVAC equipment. This session will explore the intersection of advanced wood heating and highly efficient buildings and highlight the continued importance of wood fuels to Vermont’s renewable energy, GHG emissions, economic development, and “working landscape” goals. Presenters will cover how to utilize this technology in today’s highly efficient buildings, focusing on both residential and commercial applications. We will discuss strategies typically used to achieve a high level of efficiency and tight building envelope, and the benefits and risks of tight buildings. We will provide an overview of the pros and cons of the different heating systems suitable to low load buildings, and what cost range to expect for different HVAC options for a New England climate. We will discuss when modern wood heat is appropriate in tight buildings and the options currently available in the market, and discuss when heat pumps are a better choice.

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED

Beyond CFM50: Blower Door Diagnostics R & C / Intermediate
EMERALD III

David Keefe, Efficiency Vermont

This session for blower door practitioners will focus on using diagnostic techniques to find air leaks and to verify air-sealing effectiveness. It will start with issues of accuracy, including temperature correction, dealing with wind, and maintenance. The use of chemical smoke and infrared scanning will be covered. There will be an introduction to zone pressures and how they can be used to assess both pre and post conditions. Connections to garages and attics will be emphasized. The presenter will discuss how to evaluate airflow through rooms and other spaces without going into them. Attendees should be knowledgeable about blower door testing and ready to become more skilled at understanding airflows in buildings.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Commissioning, Operating, and Maintaining Air-to-Air Energy Recovery Systems C / Advanced
EMERALD I

Hoy R. Bohanon, Jr., Hoy Bohanon Engineering

How does one commission energy savings equipment such as air-to-air energy recovery? What key performance factors must be measured? When can you simulate and when must you measure? Devices addressed include air-to-air energy recovery plates and wheels, desiccants, runaround loops, and water-side economizers.

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED

Elm Place: Post-Occupancy—Solving the Data Puzzle R & C / Intermediate
AMPHITHEATRE

Karen Bushey and Craig Simmons,
Vermont Energy Investment Corporation
Miranda Lescaze, Cathedral Square

Elm Place, an affordable senior living development in Milton, Vermont, was the first multifamily Passive House building in the state. Cathedral Square’s motivation to pursue Passive House was rooted in not only extremely low operation costs, but also the desire for a building that would be comfortable, resilient, durable, and healthy. But is Passive House delivering on its promises? The presenters will discuss key design decisions including the challenges of rightsizing heat pumps and selecting suitable mechanical systems for a low load building. A building management system (BMS) has been particularly valuable for analyzing energy use data—which have suggested significant differences between modeled and actual energy use. This session will cover the importance of undertaking post-occupancy monitoring to uncover mechanical issues that can significantly increase actual energy consumption and how monitoring has been critical to arriving at actionable data and interpretations. The team will also highlight cost-effective strategies for incorporating data monitoring in other multifamily projects.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Tier 3 Statewide Total Energy Program: One of Vermont’s Most Effective Climate Protection Strategies R & C / Intermediate
DIAMOND I

Richard Faesy, Energy Futures Group
Brian Otley, Green Mountain Power
Patricia Richards, Washington Electric Co-Op
Darren Springer, Burlington Electric Company

Tier 3 of Act 56 of 2015 (also known as Statewide Total Energy Program, STEP Beyond Fossil Fuels) is one of Vermont’s best-kept climate strategy secrets. This session will provide an overview of what it is, what it is doing for Vermont now, its projected impacts for the future, and how it can help Vermonters meet their climate and energy goals. The presenters will highlight some of the programs and projects the utilities are currently offering to make it real and provide some of the resulting data. Finally, they will present an analysis that examines the rate impacts of implementing Tier 3/STEP by electrifying the heating of buildings, transportation, and commercial facilities and weatherizing buildings that shows the potential for rate reductions while helping meet the State’s climate goals.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Passive House Institute of US (PHIUS)

Day 1 has been approved for 6 CPHC CEUs. Day 2 has been approved for 4.5 CEUs.

Passivhaus Institute (PHI)

Full conference is approved for 8 credit points; self-report. Contact Efficiency Vermont for ID code required to self-report.

DAY 2: THURSDAY, FEBRUARY 7

9:00 AM–12:30 PM CONCURRENT WORKSHOPS

Lessons Learned with Biomass Heating Systems R & C / Intermediate **EMERALD II**

John Siegenthaler, Appropriate Designs

Biomass boiler systems (fueled by wood pellets and cordwood) represent a growing sector of the renewable thermal heat source market. The Northeast has become the epicenter for biomass boiler system installations within the United States. These boilers have operating requirements that are distinctly different from those for boilers operating on conventional fuels, most notably the need to operate with long on cycles followed by long off cycles. This session will describe critical design and installation requirements that have been learned after several years of experience with NYSERDA (New York State Energy Research and Development Authority)-supported installations. It will address details on sizing, venting, thermal storage, controls, and hydronic distribution systems. It will also cover how contractors currently involved with heating system installation can expand their market to include biomass boiler systems.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

9:00 AM–10:30 AM CONCURRENT WORKSHOPS

High-Performance, Affordability, and Efficiency in High-Ventilation Buildings: The UVM STEM Complex C / Intermediate **EMERALD I**

Allan Ames and Bryan Rydingsward,
BR+A Consulting Engineers
Alex Halpern, Freeman French Freeman
Lynn Wood, University of Vermont

The University of Vermont STEM building is a multipurpose laboratory and classroom building that has demanding requirements for makeup air and code-required ventilation. Laboratories include fume hoods that require a substantial amount of energy and expense to operate year-round. To achieve performance requirements and remain affordable within the given program, mechanical systems were designed with specially engineered energy recovery systems that also maintain separated exhaust and supply air. This session will describe the keystone system manufactured by Konvekta, an enhanced glycol heat recovery system with specially designed coil circuiting and tubes. For the winter of 2017–2018, building automation trend logs, as well as remote monitoring by Konvekta, indicated that the system performed better than anticipated. This modeling illustrated that the initial cost of \$500,000 for this specialty heat recovery system would return nearly \$100,000 in annual energy cost savings. The discussion will focus on the design and application of this technology for laboratory buildings and space with high ventilation loads that require substantial quantities of outside air.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Making Building Systems Sing in Harmony: Retrocommissioning in Vermont C / Intermediate **DIAMOND I**

Daniel Tuhus-Dubrow, Cx Associates

Retrocommissioning (RCx) often results in significant energy savings while delivering additional benefits such as improved occupant comfort, better indoor air quality, and reduced operations and maintenance costs. RCx measures are typically low-cost and do not require large capital expenditures for implementation. The biggest challenges to increasing customer adoption of this relatively low-cost energy efficiency tool are the reluctance of customers to invest in engineering studies and a lack of customer familiarity with the opportunities. Vermont's Energy Efficiency Utilities recently established retrocommissioning programs to reduce the barriers by financially supporting the qualification stage for RCx studies, resulting in significant market uptake. This presentation will discuss common measures identified, identify best practices, and quantify the potential benefits for a cohort of projects that have gone through the retrocommissioning qualification stage. We will address key lessons learned and how to overcome obstacles to measure implementation, highlighting a few projects that have proceeded through the implementation phase.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Rethinking the Rules on Minimum Foam Thickness R / Advanced **EMERALD III**

Martin Holladay, Green Building Advisor

When installing a continuous layer of rigid foam on the exterior side of wall sheathing, it's best if the foam is thick enough to keep the sheathing above the dew point during the winter. But some builders who use thinner rigid foam than the rules call for claim that their walls stay dry, due in part to the margin of safety provided by an interior vapor retarder or vapor barrier. Because balancing the benefits and risks of walls with exterior foam and interior vapor retarders is complicated, builders are looking for guidance. This session will provide that guidance.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED



148

Building design firms

KEY TO WORKSHOP TRACKS

-  Building Systems
Sponsored by Energy Federation Inc. (EFI)
-  Integrated Design
-  Business Support
-  Commercial
-  Envelope
Sponsored by 475 High Performance Building Supply

R = Residential C = Commercial

Smart Home or Smart Homeowner?

R / Introductory
DIAMOND II

Mary Jane Poynter,
Vermont Energy Investment Corporation
Peter Hooper, State of Vermont

What does it mean to have a connected home? Are we really smarter than ever because of the technology we surround ourselves with? We'll explain why being a smart homeowner can be more effective than owning a home filled with smart devices. This session will provide examples of how connecting with residential properties can save energy, increase equipment life, and help avoid emergencies. The market is flooded with meters, software, and gadgets that make a dwelling space connected. We will highlight several technologies and take an in-depth look at their primary functions, how they interconnect, and how the owner interacts with them. Also included will be an introduction to the Parsons Platform, a cloud-based energy database being used by Housing Vermont to monitor its large portfolio of buildings and identify underperforming buildings.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Starving for Darkness: How Exterior Lighting Affects Our Wildlife

R & C / Intermediate
AMPHITHEATRE

Jane Slade, Anatomy of Light

Since the Industrial Revolution and the invention of the electric light bulb, the natural ecosystems of the Earth spend more and more time bathed in artificial light within a 24-hour cycle. How do artificial light and the lack of darkness impact wildlife? How does the obstruction of the night's sky affect bird migration and whale migration? This talk will review scientific studies showing the impacts of light upon wildlife. From zooplankton, to insects, to bats, all species are either directly or indirectly affected by light and light pollution. The talk will conclude with a discussion on how a rethinking of design and codes can alleviate some of these harmful effects.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED, NCQLP

11:00 AM–12:30 PM CONCURRENT WORKSHOPS

Affordable and Profitable: An Oxymoron? We Don't Think So!

R & C / Introductory
DIAMOND I

Mel Baiser and Kate Stephenson,
HELM Construction Solutions LLC

This session will address the question of how to make healthy, energy-efficient buildings more affordable, but not at the expense of the builder's business sustainability. How can builders deliver an affordable high-performance project without losing their shirt on it? The first step is understanding what it costs to run the business. This session will walk builders through the process of developing an operating budget for their company. Participants will learn how to calculate labor burden and gross profit margin, how to understand the difference between a margin and a markup, and how to use that information to develop a project estimate that covers the cost of running the business and making a profit. The presenters will talk about strategies for managing client expectations with regard to budget and the art of value engineering using an integrated team approach.

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED

Carbon-Based Life Forms Creating Carbon-Free Buildings

R & C / Intermediate
EMERALD III

Eric Corey Freed, Morrison Hershfield

In the last decade, carbon levels increased by 20 parts per million (from 380 to 403), the population grew by 1 billion, global temperature increased by half a degree Celsius, and 25 percent more people moved into cities. The world is changing rapidly. This session will explore dozens of disparate trends in technology, sustainability, and the construction industry and connect the dots to get a glimpse into how we can save the world and save our businesses at the same time. Participants will forecast opportunities in the green building space. Climate change is redefining building design parameters. Future solutions will need to measure and manage energy, water, and health outcomes in innovative ways. During this energetic and entertaining session, attendees will collaborate to better address systemic barriers to healthy, high-performing, sustainable, resilient buildings. The session will discuss the challenges and complexities facing project teams pursuing net-zero or zero-carbon projects and how to identify new risks. This lively discussion will change how participants look at the future, regardless of how bleak it may seem!

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

The Value of Flexible Demand and Storage: Aligning Building and Grid Efficiencies

C / Intermediate
DIAMOND II

Morgan Casella, Dynamic Organics
Marcus Jones, Vermont Energy Investment Corporation
Jeff Monder, Green Mountain Power
John Sohl, Brattleboro Retreat

The Brattleboro Retreat hospital in Brattleboro, Vermont, requires significant air conditioning during the summer, with peak demands of 110–120 kW. Previously under CVPS's time-of-use rates, the Retreat utilized an ice-storage system to load shift hospital cooling demands to off-peak times. Since 2014, the ice storage asset had been underutilized and improperly controlled. During 2017 and 2018, Efficiency Vermont worked with the Retreat and Dynamic Organics (DO) to recommission the existing system and upgrade the campus building management system. This session will describe how DO and Green Mountain Power are developing an innovative pilot in collaboration with Efficiency Vermont to investigate the value of the ice storage in providing capacity, energy, and greenhouse gas savings for the customer and the grid. The group is testing different charging and discharging strategies at the Retreat following different forecast and real-time signals. The team is leveraging behind-the-meter controls to effectively use buildings as batteries, while aligning building and grid efficiency.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

Passive House Institute of US (PHIUS)

Day 1 has been approved for 6 CPHC CEUs. Day 2 has been approved for 4.5 CEUs.

Passivhaus Institute (PHI)

Full conference is approved for 8 credit points; self-report. Contact Efficiency Vermont for ID code required to self-report.

🔧 Vermont's New 2019 "Residential Building Energy Standards" Energy Code

R / Intermediate
AMPHITHEATRE

Richard Faesy, Energy Futures Group
David Keefe, Efficiency Vermont

Vermont's Comprehensive Energy Plan states that all new construction must be built to net-zero standards by 2030, but how will we get there? Between now and then, four cycles of code updates will progressively step Vermont along to meet the 2030 goal. That first step is expected to be adopted in early 2019 as the next version of Vermont's energy codes. This session will present the Residential Building Energy Standards (RBES) updates for this most recent code cycle and will provide an update on the new code, highlight the changes from the current code, walk through the changes with the biggest impacts, and provide the information needed to ensure code compliance for future building projects. The presenters will also provide an update and information on the "stretch code."

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

🏠 Your Next Breakthrough—Efficient Emerging Technologies for Your Home and Business

R & C / Introductory
EMERALD I

Lara Bonn, Laura Capps, and Lauren Morlino,
Efficiency Vermont
Rachael Mascolino, Vermont Energy Investment Corporation

What's new and exciting in the world of energy efficiency? What more can you do for your home or business? This session will feature the Efficiency Vermont Emerging Technologies and Services team, who will engage the audience by presenting accessible, healthy, efficient options for homes and businesses during a confusing and rapidly advancing technological era. The team has been working to fill Efficiency Vermont's portfolio with new technologies and services in order to continue to offer Vermonters valuable technical assistance and low energy costs. The group will highlight projects including Efficiency Vermont's Healthy Homes initiative, indoor agriculture, natural refrigerants, connected homes/Internet of Things, vegetable oil-powered elevators, lab ventilation, comprehensive building control systems, and more.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED, NCQLP

1:45 PM–3:15 PM CONCURRENT WORKSHOPS

🏠 Building for "Forever": High-Performance Design for Everyone

R / Introductory
EMERALD II

Brian Just, Vermont Energy Investment Corporation

Much of what defines quality in home materials—durability, livability, simplicity, beauty, and resilience—has been around for centuries. A lot of historical design aligns perfectly with today's concepts of affordability, especially when combined with modern materials and building techniques. This presentation explores enduring design guidelines from a non-architect perspective. After a crash course on influences including Victorian artist John Ruskin, "old" Audels Builders Guides, pattern language, and classic New England building forms, this session will dive into design features that have survived and those that have not. Participants will learn how modern-day principles of LEED and Passive House can be incorporated cost-effectively and attractively. The session will give striking examples of how high performance can be done simply and how design decisions can promote occupant comfort and health while making future additions or upgrades less complicated. These principles will be supported by solid data, including real-world photos and infrared images from Vermont's countryside. This session is all about the intersection of affordability and quality. It is designed for builders, architects, plumbers, engineers, real estate professionals, and homeowners.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

🏠 Evaluating What Matters Most: Revisiting Design to Meet Budgets and Keep the Dream Alive

R / Introductory
DIAMOND II

Colin Lindberg, Shelterwood Construction
Parlin Meyer, BrightBuilt Home
Jesse Thompson, Kaplan Thompson Architects

Making decisions when building one's dream home has never been easy. Making those decisions in today's landscape of lumber tariffs, no incentives, and busy contractors is nearly impossible. In this session, the presenters will look at the journey undertaken by a couple who set out to build their dream home together, and ventured well into design only to realize their dreaming had begun to outstrip their needs (and their budget). They took a look at what they really wanted, and requested a redirect with their architects. In concert with the builder, the clients and the architects worked together to arrive at a Plan B—one that captured the essence of the clients' wants and needs, and more aggressively pursued their budgetary considerations. This session will look at each of the designs proposed, and speak to the thinking behind forms, volumes, and area, as well as the associated costs of each.

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED

🔧 Hands-On Air Sealing and Basement Insulation Skills

R & C / Intermediate
EMERALD III

David Keefe, Efficiency Vermont

This session is intended for those who do air sealing and insulation with their own hands, those who would like to, and those who specify and inspect that work. We will start with an overview of our goals and approach, then move to a review of air sealing materials used for residential and stick-framed commercial buildings. Three-dimensional props will be used for a live demonstration of common air sealing measures, focusing primarily on attics. There will also be a discussion of

KEY TO WORKSHOP TRACKS



Building Systems

Sponsored by Energy Federation Inc. (EFI)



Integrated Design



Business Support



Commercial



Envelope

Sponsored by 475 High Performance Building Supply

R = Residential C = Commercial

basement insulation and a review of options for basement walls. The focus will be primarily on existing homes, although most of the information is also applicable to new construction.

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED
Session sponsored by rk MILES

▣ The Mechanical Aspects of "Practical Green" Commercial Buildings C / ADVANCED DIAMOND I

Roy Swain, Kohler and Lewis

This session will discuss a comprehensive list of the best "practical green" plumbing and HVAC design elements from more than four decades of engineering experience. The presenters will begin by identifying the multiple and often conflicting objectives of mechanical systems in buildings, and then explore the specific practical green elements of achieving each objective. The session will also feature interesting cases of "how not to do it"—too expensive, too complicated, or most often both. Examples and photos will be from actual projects.

Accreditation: AEE, AFE, AIA LU, ASHRAE, BPI, CSI, LEED

📌 Testimonials from an Affordable Housing Developer and Her Consultants R & C / Intermediate EMERALD I

Julie Klump, Preservation of Affordable Housing
Ken Neuhauser and Wesley Stanhope,
Building Evolution Corporation

This team of affordable housing developer and building performance consultants (with expertise in HVAC and enclosures) have been through many battles together, including high-performance new construction projects, moderate scope rehab, deep energy retrofits, retrocommissioning projects, and lots of why-isn't-this- $\&^*\#$!-system-working investigations. The presenters will regale workshop participants with such tales as 1) the elusive breath of fresh air—getting good indoor air quality in renovations of existing multifamily buildings; 2) integrated construction—why integrated design is not enough and why it's important to have designers engaged throughout construction; 3) retroCx (because it wasn't running right the first time); 4) the high cost of not super-insulating; and 5) "What's the payback?" and other unhelpful questions. The focus will be on larger multifamily buildings and will cover several states and multiple climates. The presenters will share lessons learned and also probe the workshop participants for solutions to perennial challenges in affordable housing building performance.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED



313
Retailers

Passive House Institute of US (PHIUS)

Day 1 has been approved for 6 CPHC CEUs. Day 2 has been approved for 4.5 CEUs.

Passivhaus Institute (PHI)

Full conference is approved for 8 credit points; self-report. Contact Efficiency Vermont for ID code required to self-report.

✉ Utilizing Insulated Concrete Forms (ICFs) to Achieve Affordable Efficiency for Residential and Commercial Multistory Buildings R & C / Advanced AMPHITHEATRE

Paul Camozzi, Amvic

The presentation will begin with a brief history of the ICF industry, and then move to an in-depth description of what an Insulated Concrete Form is, including performance and technical information. We will then address what is happening on a national level with respect to energy efficiencies and how ICFs directly mitigate these changes in one simple application. Actual residential and commercial builds will be examined and explained with quotes from consumers and design professionals, many of whom do not go back to conventional builds. Affordable efficiency is easily applicable to ICFs on two fronts—first significant energy reductions and downsizing of complementary systems, second, efficiencies gained in actual field performance due to a nine-to-one construction methodology. The wrap-up will include project profiles and statements from the likes of Avalon Bay and developer /owners who have had wonderful experiences with ICF technology.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

3:30 PM–5:00 PM CONCURRENT WORKSHOPS

✉ A Vapor-Open Airtight Wall Assembly That Improves the Drying of the Envelope R / Introductory AMPHITHEATRE

Nick Stone, rk MILES

Consumers today are saying, "I am more confused now than ever before about what material I need to put into my wall system" or "I am concerned that certain products won't work well in conjunction with each other; what should I do?" The presenter's company has developed and tested a wall system called VOAT-WALL that uses vapor-open products that work in harmony with each other to make a high-performing wall system that is durable and effective. It combines a drainable mineral fiber insulation with a fully adhered weather-resistant barrier to make the system airtight along with a fully insulated EPS buck system around windows openings to allow for a continuous thermal break.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

✉ Affordable Multifamily Housing: Net Zero and Passive House? Challenges, Opportunities, Mistakes, and Solutions R & C / Intermediate EMERALD III

Laura Bailey and Bill Maclay, Maclay Architects
Tim Estes, Estes & Gallup, Inc.
Andrew Winter, Twin Pines Housing

If high-end clients can't "afford" either Passive House or net zero energy (NZE) certification, how can nonprofit housing developers possibly afford both? Twin Pines Housing is taking on this challenge at a 29-unit affordable housing project in West Lebanon, New Hampshire. The project addresses a challenging combination of long-term capital costs, incentives, financial requirements, and limited budget. The session will show how this team addressed these numerous uncertainties and its reasoning in pursuing combined NZE and Passive House certifications. Pursuing NZE certification was agreed to near the beginning of design for financial reasons; Passive House certification is being pursued as potentially

achievable with the building as designed for NZE. The presenters will share where the project is in the NZE and PHIUS certification processes and will investigate the financial aspects of both NZE and Passive House and how they can contribute to high-performance multifamily housing's financial success and long-term affordability on other projects.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

 **Beyond Energy Efficiency—
Why Embodied Carbon in
Materials Matters** R & C / Intermediate
EMERALD I

Chris Magwood, Endeavour Centre
Ace McArleton and Jacob Racusin,
New Frameworks Natural Design/Build

The impact of materials and the construction process on a building's carbon footprint is referred to as "embodied carbon." With today's more energy-efficient enclosures and mechanical systems, as well as cleaner energy sources, some of the largest carbon impacts can come before the building has been occupied. The good news is that building materials can store large amounts of carbon taken from the atmosphere and act as "carbon sinks," banking carbon emissions for generations. This session will look at why embodied carbon matters and how it relates to operational carbon emissions. The panel will present both real-world case studies and modeled scenarios to illustrate the impact different materials and methods have on the embodied carbon profile of the building. Presenters will make recommendations on a range of strategies that designers and builders can use to reduce their buildings' carbon footprint and turn them into carbon sinks. Finally, the session will discuss activities of the Embodied Carbon Network, a national professional group tackling this issue head-on and showcasing the most cutting-edge strategies.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

 **Energy Improvements in Public
Purpose Buildings: PPESCO
Case Studies** R & C / Intermediate
DIAMOND I

Mike Davey, Energy Efficient Investments (EEI)
Paul Kervick, Awakening Sanctuary, Inc.
Craig Simmons, Vermont Energy Investment Corporation
Marc Therrien, BROCC Community Action

Commons Energy is a company that offers significant energy savings for buildings that serve a public purpose. These can include educational institutions, healthcare facilities, municipal and other community buildings, and multifamily affordable housing. The Commons Energy Public Purpose Energy Service Company (PPESCO) model combines a full complement of energy services with patient capital from several sources in an approach that helps organizations take advantage of energy savings from building improvements. This presentation will explain the PPESCO model and provide two very different case studies of recently completed energy performance projects. The first case study is a senior care facility in Montpelier, Vermont, where energy upgrades included an innovative application of a heat pump water heater. The second case study is the headquarters of a community services organization in Rutland, Vermont, that includes a food shelf and whose building systems were on the verge of failure prior to the energy retrofit. The presentation will explore the various technical solutions but also the project process and financing structures.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

 **Meeting the Passive House
Airtightness Standard in a Historic
Downtown Building** R & C / Intermediate
EMERALD II

Lynn Cetrano, Black River Design Architects
Sue Cobb, Housing Vermont
Jon Haehnel, BVH Integrated Services
Dave Stanley, Trumbull-Nelson Construction Company

The Passive House Institute US (PHIUS) has one of the most stringent building airtightness standards in the United States. This standard is very challenging to meet in new construction of multifamily housing. Is it even possible to meet the same standard in an existing historic downtown Montpelier multistory building? This panel discussion will describe the strategies taken to meet the PHIUS standard. There will be four presenters. The architect and building enclosure commissioning agent will describe what areas were focused on to ensure that the 0.05 CFM50/exterior surface area standard was met. The owner representative will discuss why the Passive House airtightness goal was important to the long-term affordability of the property. The site superintendent will talk about the challenges of implementing the details on the job site.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED

 **The New Wave of State
Appliance and Lighting
Energy Efficiency Standards** R & C / Intermediate
DIAMOND II

Curtis McCormack, Vermont House of Representatives
Christopher Granda, Appliance Standards Awareness Project

Two bills designed by the Appliance Standards Awareness Project have been signed into law as Acts 42 (2017) and 193 (2018) in Vermont. They include 17 new Vermont state energy efficiency mandatory standards. These standards do not exist at the federal level, and in several cases had not been put in place by any other state. In our region, Rhode Island and Massachusetts may also have passed similar legislation by the time of the BBD conference. By taking this leadership position, Vermont and other states are continuing the 40-year legacy of commonsense energy efficiency standards that are being threatened by the Trump administration. In this presentation, we will talk about the role of energy efficiency standards in reducing consumer costs and environmental impacts, and review the specific requirements and paths to compliance.

Accreditation: AEE, AFE, AIA LU/HSW, ASHRAE, BPI, CSI, LEED, NCQLP

KEY TO WORKSHOP TRACKS

-  Building Systems
Sponsored by Energy Federation Inc. (EFI)
-  Integrated Design
-  Business Support
-  Commercial
-  Envelope
Sponsored by 475 High Performance Building Supply

R = Residential C = Commercial



Keynote



Ruth Ann Norton
Green & Healthy Homes Initiative (GHHI)

Ruth Ann Norton, president and CEO of Green & Healthy Homes Initiative (GHHI), is a national expert on lead poisoning prevention; innovative financing; and healthy, safe, and energy-efficient housing. Norton has led GHHI's innovative work to use housing as a platform

for improved health, economic, and social outcomes for America's children and seniors. She was the architect for Maryland's 98% reduction in childhood lead poisoning and has authored 35 pieces of lead poisoning prevention and healthy housing legislation across the United States. She is the lead author of GHHI's "Strategic Plan to End Lead Poisoning—A Blueprint for Action" and has written numerous City- and State-level plans. She designed and co-chaired the National Summit to End Lead Poisoning and has served on numerous national panels on lead poisoning prevention for the CDC, HUD, EPA, and the White House. In addition, she has crafted successful federal policy initiatives, and her groundbreaking work has advanced the role of Medicaid as well as the energy efficiency, education, and philanthropic sectors in supporting investments in healthy housing in our nation's lowest-income neighborhoods. An economist by training, Norton is a sought-after speaker on the moral and business case for creating healthier housing to improve outcomes for children, seniors, and communities. Her work on healthy housing's cost-benefit analysis led GHHI to establish its Pay for Success practice, helping to scale evidence-based interventions to create healthy, safe, and energy-efficient housing.

Presenters

Allan Ames

Allan Ames, president of BR+A, is a registered professional mechanical engineer in 18 states and a LEED accredited professional. With over 35 years of experience, he is a frequent presenter at industry symposia including the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Tradelines, and the New England Chapter of I2SL (formerly Labs21). Allan is heavily involved in engineering design for a broad range of project types for academic, research, healthcare, pharmaceutical, and corporate clients nationwide. In addition, he is a Building Systems Committee member for the Healthcare Associated Infections Foundation and ASHE.

BR+A Consulting Engineers
10 Guest Street, 4th floor, Boston, MA 02135
617-254-0016 • aames@brplusa.com

Laura Bailey

Laura Bailey is the research director at Maclay Architects and works on energy-efficient design, analysis, and monitoring. Her past work has included permaculture, biodiesel production, solar installation, and off-grid design/build. She was also a research fellow at the Energy Studies in Buildings Lab at the University of Oregon. At Maclay Architects, she executes comparative energy and cost analysis to develop financial information on proposed designs. Additionally, she has worked on projects and master plans combining site, program, and client needs for creative future-oriented solutions. Laura holds a B.A. in environmental design from Williams College and a master of architecture degree from the University of Oregon, and is a certified Passive House consultant.

Maclay Architects
4509 Main Street, Waitsfield, VT 05673
802-496-4004 • laura@maclayarchitects.com

Mel Baiser

Mel Baiser is a partner in HELM Construction Solutions, which works with owners, designers, and builders to create high-performance and sustainable buildings and businesses. Mel has over 15 years of experience in the construction industry, both in the field as a carpenter and weatherization installer and in the office as a project manager and estimator. Mel has completed certifications with the Building Performance Institute and the Passive House Institute US. With a background in social justice and community organizing, Mel is passionate about weaving together efforts for climate justice, building high-performance homes, and improving the process of doing construction while maintaining triple-bottom-line business principles for the professionals involved.

HELM Construction Solutions LLC
139 Main Street, Suite 602, Brattleboro, VT 05301
802-380-1841 • mel@buildhelm.com

Hoy R. Bohanon, Jr.

Hoy Bohanon, P.E., LEED AP, BEAP, is principal in Hoy Bohanon Engineering, PLLC, a firm that focuses on improving the performance of existing mission-critical buildings. Hoy has worked as a research and design engineer, project engineer, facilities engineer, facilities manager, indoor air quality research engineer, environmental engineer, and business owner. He holds a master's degree in engineering and a bachelor's degree in mechanical engineering. Hoy has written technical papers and articles on indoor air quality, operations, and maintenance and is a frequent presenter at technical society meetings. He is a co-author of ASHRAE's *The Indoor Air Quality Guide: Best Practices for Design, Construction and Commissioning* (2009) and *Performance Measurement Protocols for Commercial Buildings: Best Practices Guide* (2012).

Hoy Bohanon Engineering, PLLC
8236 Arbor Ridge Lane, Clemmons, NC 27012
336-972-1626 • bohanoneng@gmail.com

Lara Bonn

Lara Bonn is the director of Efficiency Vermont's Emerging Technologies and Services Department, which facilitates new and disruptive opportunities for energy efficiency in Vermont. In the past, she was a staff manager in the Strategy and Planning Department as well as the strategic planning manager for efficient products, creating the strategic vision, designing new program approaches, and running research and development pilots for the lighting, appliances, and consumer electronics programs. Lara promotes multi-utility and cross-country partnerships to accomplish greater impact. Prior to working for Efficiency Vermont, Lara worked as a consultant with Optimal Energy and as a senior consultant with Booz Allen Hamilton working exclusively for the U.S. EPA.

Efficiency Vermont
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7853 • lbonn@veic.org

Karen Bushey

Karen Bushey, AIA, LEED AP, CPHC, joined Vermont Energy Investment Corporation as a residential energy consultant with the goal of helping homeowners, builders, and architects create comfortable, durable, low-energy homes that optimize building performance. As a licensed architect, certified Passive House consultant, and PHIUS+ rater, and with over 20 years of experience in the field of building design and construction, Karen has been key to the success of many residential and commercial projects in New England. Her work on the Elm Place Senior Housing project won three national awards from the Passive House Institute US (PHIUS). Karen earned an architecture degree from Carnegie Mellon University, and she is secretary of Vermont Passive House.

Vermont Energy Investment Corporation
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7818 • ksbushey@veic.org

Paul Camozzi

Paul Camozzi, CET, educates architects, engineers, builders, and consumers on the benefits of building with insulated concrete forms (ICFs). His career started in structural steel, a key component in ICF construction methodologies. He has been the past chairman of the Insulating Concrete Form Association and is active with the National Ready Mixed Concrete Association, which is embracing ICF promotional programs across the United States. Paul holds a diploma in mechanical engineering. He has personally built two ICF homes and can speak on this technology from conceptual design incorporating net-zero goals to a renewed focus on resilient, sustainable construction.

Amvic Building System
501 McNicoll Avenue, Toronto, ON L9P 1R1
905-852-5147 • pcamozzi@amvicsystem.com

Laura Capps

Laura Capps has provided classroom and field training for over 2,600 professionals nationally on healthy homes and green building. At Efficiency Vermont, Laura facilitates the identification, research, development, and qualification of new disruptive technologies and services for the state's future energy portfolio. Her current work includes partnering with hospitals and healthcare providers on improving population health through energy efficiency and healthy home interventions in the homes of patients with uncontrolled asthma and COPD. Laura holds degrees in sustainable development and building construction from Appalachian State University and Georgia Tech, respectively, and multiple industry certifications and awards.

Efficiency Vermont
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7841 • lcapps@veic.org

Morgan Casella

Morgan Casella is managing partner of Dynamic Organics (DO), where he has worked for over 10 years in sustainable energy and HVAC efficiency project development, design, construction, and operations and maintenance. Morgan has experience with solar development, anaerobic digestion, landfill gas-to-energy generation, and building energy systems including HVAC design, optimization, installation, and retrofits. Through DO, Morgan has provided development and consulting work for companies interested in alternative energy, energy efficiency, sustainable agriculture, and alternative waste reduction strategies. Morgan has an extensive background in the development and design of renewable energy and efficiency projects, with a focus on distribution, transmission, and efficiency utility regulatory requirements. He holds a B.S. from Skidmore College.

Dynamic Organics
104 East Putney Falls Road, Putney, VT 05346
303-834-2871 • mcasella@dynorganics.com

Lynn Cetrano

Lynn is a project manager at Black River Design Architects. She has worked on both new and renovation projects over the past 19 years with the company. Lynn has worked on various project types including education, hospitality, institutional care, housing, medical office, and historic preservation. She enjoyed the collaborative approach of the French Block project as the team worked on finding the best solutions to combine energy efficiency, historic preservation, and housing standards from design through construction.

Black River Design Architects
73 Main Street, Montpelier, VT 05602
802-223-2044 • lynnc@blackriverdesign.com

Sue Cobb

Sue is a project manager at Housing Vermont and has worked on many historic renovation projects in her 28 years with the company. Sue is particularly interested in balancing energy efficiency strategies, resident comfort, and capital and operating costs with building codes, ventilation requirements, and historic preservation standards.

Housing Vermont
100 Bank Street, Suite 400, Burlington, VT 05401
802-660-9034 • sue@hvt.org

Roger Cooney

Roger Cooney has committed his career to high-performance sustainable design and construction. This work includes involvement in projects that meet or surpass the standards of the EPA's ENERGY STAR® program, LEED for Homes, deep energy retrofits, and the International Living Future Institute's Living Building Challenge. Wright Builders recently completed its Hinckley Trace net-zero ready development, Village Hill, which is built to both ENERGY STAR and LEED for Homes (Silver, Gold, and Platinum certifications) standards, a Passive House-inspired home in southern Vermont, and two Living Building Challenge projects. Roger previously owned Full Circle Design, is a co-founder of Creative Environments LLC, and has been with Wright Builders for 14 years.

Wright Builders, Inc.
48 Bates Street, Northampton, MA 01060
413-586-8287 x104 • rcooney@wright-builders.com

Mike Davey

Mike Davey is the business development manager for Energy Efficient Investments (EEI), a midsized performance contractor that focuses on energy-efficient and renewable solutions. The EEI team has completed comprehensive performance contracts for Bennington School District, BROCC, and Addison Northwest School District. Mike has been in the energy efficiency and construction industry for more than 15 years. He holds a bachelor's degree from Wentworth Institute of Technology and a master's degree from the University of Massachusetts at Lowell.

Energy Efficient Investments (EEI)
19D Star Drive, Merrimack, NH 03054
603-423-6000 • mdavey@eeiservices.com

Keith Downes

Keith Downes is an associate director for Navigant Consulting in the customers and markets practice area. Keith advises utilities across North America in both program design and program evaluation work, and also conducts best practice studies, baseline/potential studies, and energy code and TRM updates. Prior to working at Navigant, he was an energy advisor at Efficiency Vermont specializing in commercial new construction projects. Keith earned an M.S. in mechanical engineering from Lehigh University; he is also a certified energy manager.

Navigant
180 Howard Street, Burlington, VT 05401
802-526-5103 • keith.downes@navigant.com

Tim Estes

Tim Estes is the president of Estes & Gallup, Inc., which was first incorporated in 1972 and since that time has steadily and proudly built a stellar reputation, first in residential construction, and for the past decade in commercial, industrial, institutional, and retail construction and renovation. Tim is a skilled construction project manager with over 20 years of experience. His specialty is pre-construction and project programming along with construction phase management. He particularly enjoys being a member of the project team from conception and tackling tough logistical issues.

Estes & Gallup, Inc.
P.O. Box 240, Lyme, NH 03768
603-795-4400 • tim@estes-gallup.com

Richard Faesy

Richard Faesy is a principal and co-founder of Energy Futures Group in Hinesburg, Vermont. As a certified energy rater, LEED accredited professional, and DOE home energy score assessor, he specializes in residential buildings, technologies, and markets. He has expertise in residential new construction and retrofits, energy rating and labeling, building codes, financing, green building, the integration of renewables and energy efficiency, and effective energy efficiency policy, program design, and implementation. He works with clients throughout the U.S. and Canada.

Energy Futures Group
P.O. Box 587, Hinesburg, VT 05461
802-482-5001 • rfaesy@energyfuturesgroup.com



106,400

Households served



\$79,674,544

Saved by households

Cheryl Fatnassi

Cheryl Fatnassi has over 30 years' experience in financial management, community development, banking, and IT systems. She is currently president and CEO of Opportunities Credit Union, a community development credit union serving a low-income membership. Her experience includes senior management positions at Banknorth Group. Cheryl's community activities include board service at INCLUSIV (formerly known as the National Federation of Community Development Credit Unions), Burlington Supportive Housing Initiatives, and the Energy Co-op of Vermont. Cheryl holds a B.A. in French and economics from the University of Vermont and graduated from the New England School of Banking.

Opportunities Credit Union
25 Winooski Falls Way, Suite 203, Winooski, VT 05404
802-654-4540 • cfatnassi@oppsvt.org

Russ Flanigan

Russ Flanigan is a senior energy analyst and solar project manager at Building Energy in Williston, Vermont. He has been in the building trades since the 1980s and deeply involved in the energy efficiency world since 2005, initially managing efficiency programs in Southern California for the Energy Coalition and then working with a consulting company called EcoMotion. Russ split his time between his roots in Vermont and California from 2008 to 2014, working on residential-scale energy retrofits in Vermont while supporting analysis and construction of commercial solar and energy efficiency projects nationwide through the California consultancy. Most recently, Russ has focused on the whole house approach to energy efficiency.

Building Energy
1570 South Brownell Road, Williston, VT 05495
802-859-3384 • rflanigan@buildingenergyus.com

Eric Corey Freed

Eric Corey Freed is an award-winning architect, author, and global speaker. As sustainability disruptor for Morrison Hershfield, he identifies solutions to problems most teams didn't know were holding them back. He was founding principal of organicARCHITECT, a visionary design leader in biophilic and regenerative design. Eric is the author of 11 books, including *Green Building & Remodeling for Dummies* (For Dummies, 2007). In 2012, his business was named one of the 25 "Best Green Architecture Firms" in the U.S., and he was named one of 10 influential green architects. He holds a prestigious LEED Fellow award from the U.S. Green Building Council.

Morrison Hershfield
13781 SE Briarfield Court, Portland, OR 97222
415-474-7777 • eric@organicarchitect.com

Kevin Fuller

Kevin Fuller, as executive vice president at Interval Data Systems (IDS), is responsible for product development, marketing, and program management for several of IDS's largest customers. Before joining IDS, Kevin spent 20 years working with relational database and data analytics vendors in technical and marketing roles. He worked on Kentucky's statewide program, Commonwealth Energy Management and Control System (CEMCS), which has helped Kentucky reduce energy bills by over \$3.3 million annually; the state enacted legislation requiring high-performance building standards that affect construction, engineering, and commissioning. CEMCS won national awards from AEE, NASFA, NASCA, and ENERGY STAR. Kevin's current work is focused on BAS automation software.

Interval Data Systems
135 Beaver Street, Suite 410, Waltham, MA 02452
781-996-4353 • kevin.fuller@intdatsys.com

Ron Gibbons

Ron Gibbons is the director of the Center for Infrastructure-Based Safety Systems (CIBSS) at the Virginia Tech Transportation Institute (VTTI). He is also the Institute's lead lighting research scientist. He is currently the PI on projects investigating the impact of outdoor lighting on human health, the spectral effects of new light sources on roadways, and the visibility of police vehicles, and is the subject matter lead for the Federal Highway Administration office Safety IDIQ contract. Ron is the author of over 80 published papers on roadway lighting, photometry, and target visibility. He is a past director of Division 4 of the International Commission on Illumination (CIE) and a past president of the Illuminating Engineering Society of North America.

Virginia Tech Transportation Institute
3500 Transportation Research Plaza, Blacksburg, VA 24061
540-231-1581 • rgibbons@vtti.vt.edu

William Gnerre

William Gnerre is CEO and co-founder of IDS. Since its founding in 2003, Bill has kept IDS focused on one vision: "to operate buildings in conformance with comfort and health/safety standards, at the lowest operating cost." IDS developed one of the first enterprise energy management platforms (EnergyWitness), incorporated operational analysis services, and began offering BAS programming services based upon ASHRAE Guideline 36. Bill's leadership activities have spanned sales and marketing, analytic services design, and project management. IDS was selected by DOE's Smart Energy Analytics Campaign as 2017's outstanding monitoring-based commissioning provider. Bill has a B.S. in mechanical engineering from Northeastern University.

Interval Data Systems
135 Beaver Street, Suite 410, Waltham, MA 02452
781-996-4353 • bill.gnerre@intdatatsys.com

Christopher Granda

Christopher Granda is a senior researcher/advocate at the Appliance Standards Awareness Project, a nonprofit organization that works on mandatory energy efficiency standards for lighting and appliances. He has over 30 years of experience in the energy efficiency field with a focus on lighting and residential appliances. He came to ASAP in 2015 after operating as an independent consultant for seven years for clients including CLASP, electric utilities, and state and federal governments. Chris also spent eight years at the Vermont Energy Investment Corporation, where he helped design and implement energy efficiency programs. Prior to that, Chris worked on efficiency programs in China, Vietnam, and South Africa for international groups.

Appliance Standards Awareness Project
422 Wes White Hill Road, P.O. Box 192, Richmond, VT 05477
802-922-7005 • cgranda@standardsasap.org

Jon Haehnel

Jon Haehnel has been testing and inspecting institutional and commercial buildings for over 16 years. Jon has tested buildings as large as a city block in downtown Manhattan and as small as an 81-square-foot automated weather station slated for Antarctica. Most of his work focuses on new and retrofit commercial and institutional construction, but he also does forensic testing to determine the root cause of high energy costs, mold, ice dams, and pipe freeze-ups. Jon is a certified Building Performance Institute (BPI) building analyst and envelope specialist. He is the blower door and energy auditor instructor for Vermont Technical College and co-author of the paper "Setting Airtightness Standards" in the *ASHRAE Journal*.

BVH Integrated Services
287 Fairview Square, Fairlee, VT 05045
802-522-9713 • jonh@bvhis.com

Alex Halpern

Alex Halpern, AIA, is vice president of Freeman French Freeman, Architects, in Burlington, where he has led projects both large and small for over two decades. Projects include the new STEM Complex and James Jeffords Hall at the University of Vermont, the Dion Family Student Center at Saint Michael's College, the forthcoming new facility for the Greater Burlington YMCA, and the Burlington International Airport.

Freeman French Freeman
81 Maple Street, Burlington, VT 05401
802-864-6844 • ahalpern@ffinc.com

Emma Hanson

Emma Hanson brings a diverse background in sales, communications, and environmental policy to the world of wood energy. After staffing the Forestry Committee of the Working Lands Enterprise Board at the Vermont Agency of Agriculture for two years, she took on the new position of wood energy coordinator at the Vermont Department of Forests, Parks, and Recreation. She holds an M.S. in agriculture, food, and environmental policy from Tufts University in Boston.

Vermont Department of Forests, Parks, and Recreation
1 National Life Drive, Davis 2, Montpelier, VT 05620
802-622-4187 • emma.hanson@vermont.gov

Eric Haugaard

Eric Haugaard is the director of product technology for Cree Lighting. His career of 31 years includes a variety of positions primarily focused on advanced lighting systems development. Eric holds a bachelor of science degree in mechanical engineering, with post-baccalaureate program studies completed at NASA/Ames Research Center at Moffett Naval Air Station. He holds 48 U.S. and 16 foreign patents related to lighting technology.

Cree Lighting
9201 Washington Avenue, Racine, WI 53406
262-884-3175 • eric.haugaard@cree.com

Martin Holladay

Martin Holladay is the editor of *Green Building Advisor* and a senior editor at *Fine Homebuilding*. His weekly blog, "Musings of an Energy Nerd," focuses on energy-efficient residential construction. He built his first passive solar house in northern Vermont in 1974, and has lived off the grid since 1975. Before working as an editor, Holladay was a roofer, remodeler, and builder. He has also worked as a project manager for a nonprofit developer of low-income housing.

Green Building Advisor
P.O. Box 153, Sheffield, VT 05866
802-626-1082 • martin@greenbuildingadvisor.com

Peter Hooper

Peter Hooper is an electrical engineer and project manager with the State of Vermont's Energy Office. He works primarily in project development and oversight work, including the planning, completion, and verification of energy efficiency, energy conservation, and renewable energy projects. Prior to working at the State of Vermont, Peter was employed by Northern Power Systems, where he worked on the development and installation of utility-scale wind turbines. He holds a B.S. in electrical engineering from Norwich University.

State of Vermont
4 Governor Aiken Avenue, Montpelier, VT 05602
802-461-6266 • peter.hooper@vermont.gov

Marcus Jones

Marcus Jones is an energy consultant with Vermont Energy Investment Corporation (VEIC). Marcus brings an extensive background in electrical and efficiency engineering to the organization. He has worked with VEIC for the last five years helping to transform the Vermont electric grid.

Vermont Energy Investment Corporation
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7601 • mjones@veic.org

Juliette Juillerat

Juliette Juillerat provides modern wood heating consultancy. She has conducted numerous energy efficiency and renewable energy program reviews to assess program impacts and provides guidance on optimal rebate levels to balance market uptake with cost-effectiveness. She has conducted dozens of site visits and pre-feasibility assessments for converting public and commercial buildings to wood chip and pellet heating systems. Juliette has completed wood heating trainings in the U.S. and Austria, including the intensive Hydronic-Based Biomass Heating Systems course and the International Training Seminar on Biomass Heating Market Development and Technologies. She holds a B.S. in agricultural and environmental sciences from McGill University, and a master of science degree from UVM.

Vermont Energy Investment Corporation
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7914 • jjullerat@veic.org

Brian Just

Brian Just manages a team of energy consultants implementing Efficiency Vermont's residential programs and works on a variety of energy efficiency initiatives at VEIC. A mechanical engineer, he began his career designing and installing custom testing equipment used in aerodynamics research. His master's degree work focused on biomass combustion and indoor air quality. He is RESNET, Passive House, and LEED AP accredited, and is a Living Building Challenge ambassador presenter. Brian is committed to serving the residential design and construction community as its members pave the way to a future of highly efficient, affordable, healthy, durable homes.

Vermont Energy Investment Corporation
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-503-2943 • bjjust@veic.org

David Keefe

David Keefe is a fifth-generation Vermonter and a hippie environmentalist. He has worked for the last 34 years as a contractor, consultant, and teacher, focusing mostly on making existing homes work better. He has received awards from the State of Vermont and the U.S. DOE for energy innovation, and in 2011 he was named one of the 25 most influential people in the home performance industry by Affordable Comfort. In 2017, Dave received the Linda Wigington Leadership Award from the Home Performance Coalition. He is currently part of the Home Performance team at Efficiency Vermont.

Efficiency Vermont
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-849-6222 • dkeefe@veic.org

Paul Kervick

Paul Kervick is an entrepreneur, social architect, educator, and minister. Paul's passion in life is working creatively in areas that help all life to become vital and sustainable. Currently, Paul is co-founder, director, and president of Awakening Sanctuary, Inc. (dba Living Well Group), a nonprofit 501(c)(3) educational and charitable organization whose central focus is innovative approaches to holistic, vital, and sustainable community-based eldercare. It has locations in Bristol, Vermont, the Living Well Residence; Burlington, Vermont, the Ethan Allen Residence; and Montpelier, Vermont, the Heaton Woods Residence.

Awakening Sanctuary, Inc.
1200 North Avenue, Burlington, VT 05408
802-539-2939 • pkervick@livingwellgroup.org

Eveline Killian

Eveline Killian is an architectural engineer with over 20 years' experience in commercial and industrial project management and energy analysis. She has extensive experience in energy-efficient building design and operation, efficiency program design and implementation, and measurement and verification of energy efficiency measures. She has performed calibrated energy models on large commercial and institutional buildings for the NYSERDA new construction evaluation and conducted an educational webinar on the methods of calibrated modeling. She has managed the Vermont Forward Capacity Market and the NYSERDA new construction program evaluation engineering teams on M&V and data analysis for over six years.

Cx Associates
110 Main Street, Studio 1 B, Burlington, VT 05401
802-861-2715 x15 • eveline@cx-assoc.com

Julie Klump

Julie Klump, as vice president for design and building performance at Preservation of Affordable Housing (POAH), is responsible for design and energy efficiency for development projects as well as POAH's owned portfolio. She provides building investigation, energy budgeting, scope development, and cost estimates. Julie authors POAH's product and performance specifications, manages data collection and analysis, and serves as a subject matter expert. A certified Passive House consultant and LEED-certified architect with an undergraduate degree in environmental design, Julie has worked as an architect, construction manager, owner's project manager, and executive director of the Texas Historical Foundation. She received her master of architecture degree with a certification in historic preservation. Julie is a year-round bicycle commuter.

Preservation of Affordable Housing
40 Court Street, Suite 700, Boston, MA 02108
617-449-1017 • jklump@poah.org

Chris Kramer

Chris Kramer provides consulting services to government agencies, utilities, and advocates on the development of cutting-edge policies and programs designed to advance investment in energy efficiency. He has served as a financing consultant to the Connecticut Energy Efficiency Board, the California Public Utilities Commission, the New Jersey Board of Public Utilities, Lawrence Berkeley National Lab, and others. He has led or contributed to several studies and papers on energy efficiency financing topics, including a national comparison of state Green Bank programs, evaluation and cost-effectiveness methods for assessing energy efficiency financing programs, data collection on energy efficiency financing performance, lessons learned from on-bill financing and repayment programs, and best practices in residential energy efficiency financing program design.

553 Wooster Road, Whiting, VT 05778
202-351-9154 • chris.anketell@gmail.com

Miranda Lescaze

Miranda Lescaze is a real estate developer for the affordable housing nonprofit Cathedral Square. Miranda is interested in community development, and has over 15 years' experience working for community-based nonprofits. At Cathedral Square, she leads affordable housing development projects from inception through permitting, funding, design, and construction. Her previous experience includes serving as the director of the Center for Workforce Development and Diversity at Vermont EPSCoR, and as the technical coordinator for the Lake Champlain Basin Program, among other pursuits linking natural resources and community development. She has a master's degree in natural resources from the University of Vermont and a bachelor's degree from Carleton College.

Cathedral Square
412 Farrell Street, Suite 100, South Burlington, VT 05403
802-863-2224 • lescaze@cathedralsquare.org

Colin Lindberg

Colin Lindberg, certified Passive House builder, is the owner of Shelterwood Construction, a residential construction firm specializing in high-performance, energy-efficient building. His career has focused on building high-quality, long-lasting homes. Colin has a B.A. from Warren Wilson College (near Asheville, North Carolina) in outdoor leadership. His first career involved leading outdoor education trips all over North and South America. When it was time to get a real job, he turned to high-end carpentry and building. Shelterwood Construction is based in central Vermont. When Colin is not working or chasing his son around, you can find him on his mountain bike, surfboard, or snowboard, or climbing up a mountain.

Shelterwood Construction
2410 Center Fayston Road, Moretown, VT 05660
802-793-2028 • colin@shelterwoodconstruction.com

Bill Maclay

Bill Maclay is the author of the comprehensive resource for net-zero building design, *The New Net Zero* (Chelsea Green Publishing, 2014), and founding principal of Maclay Architects of Waitsfield, Vermont. Bill has pioneered a replicable model for net-zero and environmentally sustainable architecture. Through practice, advocacy, and outreach, Bill has influenced thousands in creating a renewable planet. By making sustainability inherent to his practice, Bill has been at the forefront of designing innovative projects that have served as replicable, concrete, and cost-effective models for over four decades. His firm has designed more than 14 net-zero and net-zero ready buildings, including office, educational, manufacturing, municipal, and commercial buildings in cold climates.

Maclay Architects
4509 Main Street, Waitsfield, VT 05673
802-496-4004 • bill@maclayarchitects.com

Chris Magwood

Chris Magwood is obsessed with making energy-efficient, beautiful, and inspiring buildings without wrecking the planet. He co-founded Camel's Back Construction and has designed or built around 20 homes and a few commercial buildings, mostly with straw bales and often with renewable energy systems. He brings this experience and passion to his role as curriculum developer and instructor at Endeavour. He loves working with learners and collaborating with professionals and newcomers alike to create remarkable buildings and communities. Chris has won numerous design and teaching awards, including a Home Sweet Home Award for Affordable Housing.

Endeavour Centre
910 High Street, Unit 14, Peterborough, ON K9J 2P2
705-957-3282 • chris@endeavourcentre.org

Rachael Mascolino

Rachael Mascolino is a senior energy consultant in VEIC's engineering department. Her work includes a focus on advanced wood heating as an emerging HVAC technology through design review, evaluating project feasibility, developing repeatable best practices, performing outreach, and informing Efficiency Vermont programs. Supporting the sustainable and renewable modern combustion of fuel-grade forest stock and the engineering of the comprehensive systems to which the equipment is connected is a personal and professional interest. Other recent areas of focus include VRF applications in the Northeast and institutional energy savings through continuous engagement evaluating predicted and actual energy use.

Vermont Energy Investment Corporation
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7846 • rmascolino@veic.org

Ace McArleton

Ace McArleton started out as an apprentice in the union masonry trades doing commercial construction in urban areas. He founded New Frameworks Natural Design/Build to offer green remodeling and new construction services, blending natural building materials and methods with high-performance design. Ace teaches in the Natural Building certificate program at the Yestermorrow School, is co-author of *The Natural Building Companion* (Chelsea Green, 2012), and led his business's conversion to a worker cooperative in 2016. Ace is passionate about finding practical, regional solutions to build healthy, just communities now and into the future.

New Frameworks Natural Design/Build
1 Mill Street, Suite 161, Burlington, VT 05401
802-917-4059 • ace@newframeworks.com

Curtis McCormack

Curt McCormack was a member of the Vermont House representing the City of Rutland from 1983 until 1996. He moved to his current district in Burlington in 2008. He chaired the Committee on Natural Resources and Energy for five years and was chair of the Joint House/Senate Energy Committee, vice chair of the National Conference of State Legislatures (NCSL) Environment Committee, and representative on the NCSL High Level Radioactive Waste Repository Task Force. He was also co-chair of the New England Recycling Council and vice chair of the Vermont Rail Council. He was the sponsor of Act 78, Vermont's comprehensive solid waste law. Curt is also an electrical contractor.

Vermont House of Representatives
221 North Winooski Avenue, Burlington, VT 05401
802-318-2585 • cmccormack@leg.state.vt.us

Frederick McKnight

Frederick McKnight has served, since 1980, in various roles in the mechanical engineering field, specializing in energy-efficient design of HVAC systems. His commitment to energy efficiency and superior indoor air quality has led to a focus on building enclosure assemblies and migration of air and moisture through building enclosures. Fred has design, diagnostic, and commissioning experience with high-performance buildings, a variety of convention buildings, and specialized building enclosures. He is the commissioning agent for a number of large buildings on the campuses of UVM in Burlington, Vermont; Providence College in Rhode Island; and Cornell University in Ithaca, New York. He holds an associate's degree in mechanical engineering and a B.S. in environmental science.

Turner Building Science and Design, LLC
1219 East Hill Road, Barnet, VT 05821
802-626-8233 • fmcknight@turnerbuildingscience.com

Parlin Meyer

Parlin Meyer is director at BrightBuilt Home, a design firm in Portland, Maine, that uses off-site construction manufacturers to build modified and custom versions of its high-performance home designs. After 10 years at sea as a licensed captain and deck officer, Parlin changed tack to begin a second career in the built environment by earning a master of architecture degree and a master of real estate development degree from the University of Maryland in 2012. She still enjoys sailing whenever possible .

BrightBuilt Home
102 Exchange Street, Portland, ME 04101
207-747-4822 • parlin@brightbuilt.com

Jeff Monder

Jeff Monder has over 26 years of experience in the utility industry, mostly dedicated to information technologies and project and organizational leadership. For the past three years, Jeff has been on a journey through the core mission of the utility business as a leader in innovation development, devising and introducing new programs to help residential, commercial, and industrial customers increase efficiency and productivity, reduce their carbon footprint, and save money. Jeff is passionate about the environment, and is deeply engaged in the evolution of the utility model to meet new opportunities and challenges, while satisfying the highest standards for reliability, cost-effectiveness, environmental stewardship, and social responsibility.

Green Mountain Power
2154 Post Road, Rutland, VT 05701
802-353-1183 • jeff.monder@greenmountainpower.com

Lauren Morlino

Lauren Morlino researches, tests, and plans programs, services, and strategies for the statewide energy efficiency utility Efficiency Vermont. Her work has accelerated statewide market transformation in lighting and other technologies, while meeting the evolving needs of Vermont ratepayers for cost-effective solutions. A Vermont Energy Investment Corporation (VEIC) program manager for four years, Lauren has researched and designed initiatives for lighting, controls, and consumer electronics. In her current role as emerging technologies and services manager, Lauren is prototyping exciting, innovative, and efficient technologies and services for Vermont residents and businesses. She has also disseminated the results of her work at national conferences including ACEEE, DesignLights Consortium, and E Source. Lauren holds a bachelor's degree in political science from the University of Vermont.

Efficiency Vermont
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7701 • lmorlino@veic.org

Ken Neuhauser

Ken Neuhauser has nearly 20 years of building science and building performance experience. Ken believes that building performance has many aspects, among them economic performance, environmental impact, risk management, operation, and maintenance. He is adept at diagnosing building performance problems through on-site investigation and remote data analysis. Ken is a certified energy manager, a certified Passive House consultant, and a lifetime Northeast Sustainable Energy Association member. He earned both a master of architecture and master of science degree in architecture from the University of Michigan.

Building Evolution Corporation
47 Parker Street, Maynard, MA 01754
978-201-0745 • kneuhauser@buildingevo.com

Brian Otley

Brian Otley joined Green Mountain Power in 2008 as the chief information officer, leading the company's advances into smart grid and smart metering. Shortly after Green Mountain Power acquired Central Vermont Public Service in 2013, he became chief operating officer of the company. Prior to joining Green Mountain Power, Brian spent 20 years in the software sector, leading product development and product management teams.

Green Mountain Power
163 Acorn Lane, Colchester, VT 05446
802-881-4679 • brian.otley@greenmountainpower.com

Melanie Paskevich

Melanie Paskevich has been the NeighborWorks of Western Vermont HEAT Squad program manager since 2010. Melanie advocates for homeowners, working closely with HEAT Squad's intake specialists, energy auditors, and outreach and marketing teams. She helps homeowners simplify the comprehensive energy upgrade process by coordinating with local contractors, energy committees, and utilities such as Green Mountain Power and Efficiency Vermont. In 2015, she launched Appalachia HEAT Squad in Kentucky. Melanie has over 25 years of experience in the architectural and construction field and a thorough knowledge of the building envelope and the science and technology of energy efficiency. She holds a master of architecture degree.

NeighborWorks of Western Vermont
110 Marble Street, West Rutland, VT 05777
802-797-8610 • mpaskevich@nwwvt.org

Mary Jane Poynter

Mary Jane Poynter is a senior energy consultant at the Vermont Energy Investment Corporation. She specializes in commercial, governmental, industrial, and multifamily building energy projects, working primarily with Efficiency Vermont and DC Sustainable Energy Utility. A 20-year veteran of the energy efficiency industry, she has worked on projects across the spectrum of new construction and renovation, and in the affordable housing market. Mary Jane is a certified energy manager, a certified master gardener, and a 17-year member of her local ASHRAE chapter. She holds a B.S. in mechanical engineering from the University of Minnesota.

Vermont Energy Investment Corporation
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7715 • mpoynter@veic.org

Jacob Racusin

Jacob Deva Racusin is co-owner of New Frameworks Natural Design/Build, offering services in green remodeling, new construction, consultation, and education, featuring low-impact, high-performance building technologies. Through his work as a designer, builder, consultant, and educator, Jacob is able to merge his passions for fine craft, ecological stewardship, relationship to place, and social justice. Jacob is program director of the certificate in building science and net zero design at the Yestermorrow Design/Build School, and is a BPI-certified contractor and certified Passive House consultant. Jacob wrote *Essential Building Science* (New Society, 2016) and *The Natural Building Companion* (Chelsea Green, 2012), which he co-authored with Ace McArleton.

New Frameworks Natural Design/Build
1 Mill Street, Suite 161, Burlington, VT 05401
802-782-7783 • jacob@newframeworks.com

John Rahill

John Rahill is the founder of Black River Design Architects (BRD) of Montpelier, Vermont, now employing 18 people. John's career has been committed to sustainable and high-performance design with an emphasis on durability, aesthetics, and occupant comfort. Recently, his firm completed a historic renovation and addition designed to be net-zero water and net-zero energy. The project has received "petal" certification from the International Living Futures Institute, achieving six of the seven Living Building Challenge certification criteria. John is an alumnus of the Harvard Graduate School of Design and has served as president of the Vermont Chapter of the AIA and the Solar Association of Vermont.

Black River Design Architects
73 Main Street, Room 9, Montpelier, VT 05602
802-223-2044 • johnr@blackriverdesign.com

Patricia Richards

Patricia (Patty) Richards has served as general manager of Washington Electric Cooperative since 2013. Prior to joining WEC, she spent three years as a senior consultant with La Capra Associates, a Boston-based energy consulting firm. In this role she performed a wide array of power supply related work on both the regional and national level. Before that she was the director of power supply and transmission for the Vermont Public Power Supply Authority, where she managed power supply for a number of small municipal utilities as well as WEC's interactions with the New England regional power grid. She started her utility career at Burlington Electric Department in Vermont, where she worked for 17 years in various roles including administrative and energy efficiency related positions before becoming director of resource planning. She has a master's degree in business from Saint Michael's College.

Washington Electric Co-Op
40 Church Street, East Montpelier, VT 05651
802-223-5245 • patty.richards@wec.coop

Bryan Rydingsward

Bryan Rydingsward, P.E., LEED AP, is a mechanical engineer and senior project manager with nearly 20 years' experience in heating, ventilation, and air conditioning (HVAC) system design, primarily for laboratory and hospital environments, with a strong emphasis on sustainability and innovation. Bryan has been involved with many high-profile, state-of-the-art projects, including buildings at the University of Vermont, MIT, Brown University, Dartmouth-Hitchcock Medical Center, and Harvard Medical School.

BR+A Consulting Engineers
10 Guest Street, Boston, MA 02135
617-925-8825 • brydingsward@brplusa.com

Peter Schneider

Peter Schneider provides technical support to builders, architects, engineers, affordable housing agencies, and homeowners participating in Efficiency Vermont certified high-performance homes, LEED for Homes projects, and Passive House projects. He holds a bachelor of arts degree in environmental studies and biology from Middlebury College. Peter's objective is to help clients design and construct more energy-efficient, healthful, durable, and sustainable buildings. He is a certified Passive House consultant and LEED for Homes quality assurance designee. He runs Vermont's Zero Energy Modular (ZEM) program, and offers technical support to VEIC-led ZEM projects nationwide.

Vermont Energy Investment Corporation
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-488-0916 • pschneider@veic.org

Adam Sherman

Adam Sherman is a manager of the Biomass Energy Resource Center (BERC), housed at the Vermont Energy Investment Corporation (VEIC). Adam has more than 20 years of experience in the advanced wood heat sector. His work includes policy and regulatory issues, energy program design and delivery, and technical consulting services. Adam consults frequently for public and private clients across North America, exploring the feasibility of district heating systems. He serves on the advisory board for the Alliance for Green Heat and is the chairman of the Northeast Biomass Thermal Working Group (NEBTWG). Prior to working for BERC, Adam was the general manager of a commercial composting operation in Burlington, Vermont. He received his bachelor's degree from UVM.

Vermont Energy Investment Corporation
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7863 • asherman@biomasscenter.org

John Siegenthaler

John Siegenthaler, P.E., is a mechanical engineering graduate of Rensselaer Polytechnic Institute, a licensed professional engineer, and professor emeritus of engineering technology at Mohawk Valley Community College. "Siggy" has 40 years of experience in designing modern hydronic systems. He is a member of the Radiant Panel Association Hall of Fame and principal of Appropriate Designs, a consulting engineering firm in Holland Patent, New York. He is the author of two textbooks: *Modern Hydronic Heating* (Delmar Cengage Learning; 3rd ed., 2011), and *Heating with Renewable Energy* (Delmar Cengage Learning, 2016). John currently writes about hydronics technology for several trade publications.

Appropriate Designs
9568 Steuben Valley Road, Holland Patent, NY 13354
315-865-8903 • siggy0269@gmail.com

Craig Simmons

Craig Simmons, P.E., has more than 10 years' experience in commercial building energy analysis, utility programs, and building codes compliance. In his role at Vermont Energy Investment Corporation (VEIC), Craig identifies, advocates for, and advises on energy efficiency improvements in new construction and existing industrial, commercial, and multifamily buildings. Craig is a project engineer for Commons Energy, a wholly owned subsidiary of VEIC that provides ESCO services for smaller, public-purpose buildings and owners. Craig previously worked as a consultant in Boston, providing guidance to owners and designers in pursuit of LEED certification, utility incentive programs, federal tax credits, and energy code compliance.

Vermont Energy Investment Corporation
128 Lakeside Avenue, Suite 401, Burlington, VT 05401
802-540-7952 • csimmons@veic.org

Jane Slade

Jane Slade, MID, LC, IES, is a lighting designer and researcher at Anatomy of Light, researching the many ways in which light impacts our environment, human health, wildlife, biodiversity, and interdependence. Jane is a recent Richard Kelly Grant recipient for her explorations into the social and emotional impacts of light and lighting, her work in creating lighting fixtures from waste materials in India, and art installations focused on manipulating emotional experiences with light and color. Jane is the vice president of the DLF of New England. She is also a member of the IES Committee for Outdoor Environmental Lighting and the IES Annual Conference Steering Committee. Jane practices art in her studio, Waterlight, and also teaches yoga.

Anatomy of Light
11 Everett Street, N8, Cambridge, MA 02138
617-699-0286 • janeslade@anatomyoflight.com

John Sohl

John Sohl has been the director of facilities at the Brattleboro Retreat Hospital since June 2015. Previously he worked at Lennox Hill Hospital in New York City as director of engineering and spent 17 years at Franklin Hospital in Valley Stream, New York, starting as a carpenter and finishing as the director of support services. In his current position, John also serves as the senior director of environmental operations for the Brattleboro Retreat.

Brattleboro Retreat
Anna Marsh Lane, P.O. Box 803, Brattleboro, VT 05302
802-258-4352 • jsohl@brattlebororetreat.org

Darren Springer

Darren Springer was named general manager of Burlington Electric Department (BED) in October 2018. Formerly, Darren served as BED's chief operating officer. Prior to joining BED, he served as chief of staff for the Office of Governor Peter Shumlin, deputy commissioner at the Vermont Department of Public Service, and senior policy advisor for energy and environment for Senator Bernard Sanders. He has also worked for the National Governors Association. Darren holds a B.A. from Florida Atlantic University and a J.D. and master's degree in environmental law from Vermont Law School. He is a member of the Vermont, Virginia, and Florida bar associations. Darren has also served as a policy fellow on climate change and renewable energy at UVM.

Burlington Electric Company
585 Pine Street, Burlington, VT 05401
802-865-7406 • dspringer@burlingtonelectric.com

Wesley Stanhope

Wesley Stanhope has over 15 years of leadership experience in the built environment on both sides of the Atlantic, working with construction, facility conditions assessments, energy management, and commissioning projects. As principal of Stanhope Developments, he brought over 370 commercial and residential construction projects from proposal through to design and completion in Ireland and the U.K. After returning to the U.S., Wes managed the energy auditing and retrocommissioning of more than 23 million square feet of federal facilities. Wes has extensive experience with assessment and commissioning of large-scale private universities, commercial properties, state facilities, nonprofits, and large multifamily developments. In 2016, Wes founded Building Evolution Corporation.

Building Evolution Corporation
160 Burbank Road, Sutton, MA 01590
617-963-4006 • wstanhope@buildingevo.com

Dave Stanley

Dave Stanley has been with Trumbull-Nelson for 33 years. He has run projects since he was 23 years old, starting with small residential projects and working his way up to large commercial projects. Dave enjoys all the challenges that constructing new buildings or renovating old buildings brings.

Trumbull-Nelson Construction Company
59 Elm Street, Montpelier, VT 05602
603-643-3658 • dstanley@t-n.com

Gabrielle Stebbins

Gabrielle Stebbins specializes in the development of policy and programs for promotion of renewable energy, strategic electrification, and energy efficiency, including the three together. She has expertise from her work as a consultant, as director of Vermont's statewide renewable energy industry trade association, as a member of the Vermont System Planning Committee, and as chair of the board of the Burlington Electric Department. Gabrielle brings a grounded understanding of what it takes to develop and foster clean energy legislation and regulation from her experience with management of residential efficiency programs; small-scale renewable energy incentive programs; and pilot programs promoting efficiency, electrification of space heating, and customer-sited renewables.

Energy Futures Group
P.O. Box 587, Hinesburg, VT 05461
802-482-5001 • gstebbins@energyfuturesgroup.com

Kate Stephenson

Kate Stephenson is a partner in HELM Construction Solutions, which works with owners, designers, and builders to create high-performance and sustainable buildings and businesses. She's worked with businesses and nonprofits to achieve triple-bottom-line metrics, develop business systems, and plan for a dynamic and resilient future. She led the Yestermorrow Design/Build School for over 13 years. Kate is a facilitator for NESEA's BuildingEnergy Bottom Lines program, chairs the Montpelier Energy Advisory Committee, and serves on the board of the Vermont Council on Rural Development. She holds an M.S. in management from Antioch University New England.

HELM Construction Solutions LLC
61 Prospect Street, Montpelier, VT 05602
802-225-8933 • kate@buildhelm.com

Nick Stone

Nick Stone is a passionate conceptual designer focusing on wall performance design in residential housing. As an employee of rk MILES, Nick applies all the latest technology offered in the lumber and building material industry to the emerging concepts related to efficient energy management as a result of the construction process. The VOAT (vapor open, airtight) system focuses on the integration of high-performance products, creating a durable, long-lasting wall. Nick holds an associate's degree in construction management from Vermont Technical College. Nick and rk MILES have completed about 24 houses with this system and many more with variations of the system all across Vermont.

rk MILES
618 Depot Street, Manchester Center, VT 05255
802-549-5664 • stonen@rkmiles.com

Roy Swain

Roy Swain is the owner of Kohler and Lewis Mechanical Engineers in Keene, New Hampshire. He specializes in helping commercial building owners understand and optimize their mechanical systems. He designs practical and efficient HVAC, plumbing, and control systems, including those for numerous LEED buildings, net-zero projects, and Living Building Challenge buildings. Previously, Roy managed the development of the McQuay MicroTech line of DDC controllers and was a senior project engineer at the Carrier Corporation.

Kohler and Lewis
70 Island Street, Keene, NH 03431
603-352-4841 • roy@kohlerandlewis.com

Marc Therrien

Marc Therrien is the program director for BROCC's Weatherization and Energy Conservation program. Through that program, Marc is responsible for delivering weatherization services for low-income families throughout Vermont. Marc also acts as facilities manager for BROCC's headquarters building in Rutland, Vermont, which recently underwent a significant energy retrofit and which is a participant in Efficiency Vermont's Deep Energy Retrofit program.

BROCC Community Action
45 Union Street, Rutland, VT 05701
802-775-0878 • mtherrien@brocc.org

Jesse Thompson

Jesse Thompson is a partner at Kaplan Thompson Architects in Portland, Maine. He grew up in the Northeast Kingdom of Vermont. He received his bachelor's degree in architecture from the University of Oregon in 1996. He is a Maine licensed architect (NCARB), a president elect of Maine AIA, and a LEED accredited professional. Jesse is an award-winning architect who has become a national leader in green design and building science. He's always working on balancing elements—engineering with art and design, beauty with affordability, function with potential. He's relentlessly practical, but also sees beauty in every project, and he loves a good challenge.

Kaplan Thompson Architects
102 Exchange Street, Portland, ME 04101
207-842-2888 • jesse@kaplanthompson.com

Peter Troast

Peter Troast is recognized as one of the country's foremost authorities on marketing for home performance, solar, HVAC, and other efficiency/renewable energy-related contracting companies. He and his team have helped more than 350 companies in 50 states grow their business through services such as website design and development, search engine optimization, lead generation, and strategic content production. He is a popular and high-ranking speaker about marketing for contractors at HPC/ACI, RESNET, ACCA, BPI, and EGIA conferences and events. He is the recipient of the Tony Woods Award for excellence in advancing the home performance industry.

Energy Circle
622 Congress Street, Suite 301, Portland, ME 04101
207-747-2385 • peter@energycircle.com

Daniel Tuhus-Dubrow

Daniel Tuhus-Dubrow is a mechanical engineer focused on improving energy efficiency and reducing energy costs in buildings. He has performed energy auditing and retrocommissioning activities for over 20 projects, including several for Local Law 87 (New York City) and Executive Order 88 (New York State) compliance, and has extensive experience with retrocommissioning programs in Vermont. He has experience with LEED certification, energy modeling, energy efficiency design, and measurement and verification.

Cx Associates
110 Main Street, Studio 1B, Burlington, VT 05401
802-861-2715 x21 • daniel@cx-assoc.com

Polly Wheeler

Polly Wheeler has been a designer at Black River Design for 21 years. She did all the construction documents on the project described in her conference session, and lives in an even smaller house that she recently designed and built for her family. Polly has been interested in energy-efficient design for a long time.

Black River Design
73 Main Street, Room 9, Montpelier, VT 05602
802-223-2044 • pollyw@blackriverdesign.com

Brienne Willcock

Brienne Willcock is a senior associate in lighting design with Illuminart, a division of Peter Basso Associates, near Detroit. Her design perspective has a unique combination of technical insight, creativity, and design sensibility. Brienne often serves as a project manager of in-depth investigations of LED luminaire comparisons and product research, and assists clients with design guidelines, standards, and complex economic analyses. She is past president of the IES Detroit Section, is past IES annual conference chair, and was named an honorary affiliate of the American Institute of Architects.

Illuminart
5145 Livernois Road, Suite 100, Troy, MI 48098
248-879-5666 • bwillcock@illuminart.net

Andrew Winter

Andrew Winter is the executive director of Twin Pines Housing, the leading developer and provider of affordable housing in the Upper Connecticut River Valley region for individuals and families with low to moderate incomes in Vermont and New Hampshire. He is an experienced real estate professional with a varied background in the affordable housing industry as a developer, lender, and investor. He is an attorney with low-income housing tax credit experience, as well as lending and underwriting experience.

Twin Pines Housing
226 Holiday Drive, Suite 20, White River Junction, VT 05001
802-291-7000 x108 • andrew@tphtrust.org

Lynn Wood

Lynn Wood is the Davis Zone manager at the University of Vermont. She leads a team of physical plant personnel who provide maintenance and operations support for 27 buildings that cover 1.2 million square feet. The STEM facility is one of these buildings. During the STEM Laboratory construction and commissioning, Lynn was the retrocommissioning engineer for the university. She worked extensively in the design phase providing electrical, mechanical, and controls review, sequences, and specification enhancements that were consistent with other laboratory and HVAC standards across campus. She has over 20 years of experience in controls and mechanical systems, with a focus on laboratory systems.

The University of Vermont
284 East Avenue, Burlington, VT 05405
802-656-8864 • lynn.wood@uvm.edu



15,000
Businesses served



\$103,195,055
Saved by businesses

Efficiency Vermont
**BEST
OF THE
BEST**
2019 AWARDS

Commercial
Building Design &
Construction

Recognizing excellence in design approaches for energy efficiency in Vermont's commercial buildings.

Commercial New Construction



RYAN BENT PHOTOGRAPHY

City Market, Burlington, VT
Freeman French Freeman, Burlington, VT • www.fffinc.com

Commercial Major Renovation



COURTESY OF THE PUTNEY SCHOOL

The Putney School Gray Dorm, Putney, VT
Maclay Architects, Waitsfield, VT • www.maclayarchitects.com

Partner of the Year



OLIVER PARINI

Vermont Integrated Architecture, Middlebury, VT
www.vermontintegratedarchitecture.com

Residential New Construction

Recognizing excellence in energy efficiency in residential new construction through the dedication and hard work of Vermont's building professionals.

Best of the Best in Residential New Construction



Burlington home
RG Builders

Affordability



Barnard home
Vermod Homes • www.vermodhomes.com

Innovation



COURTESY OF HELM CONSTRUCTION SOLUTIONS

Newfane home
HELM Construction Solutions • www.buildhelm.com

Efficiency Excellence Network

Recognizing an individual or firm that has demonstrated innovation, influence, and commitment to the energy efficiency industry.

Leadership



Alex Carver, Northern Timbers Construction
Ripton, VT • www.northerntimbers.com

Partner of the Year



Lloyd Plumbing Heating & Gas Services, LLC
Cabot, VT • www.lloydplumbingandheating.com

Exhibitors & Sponsors

3E Thermal

Booth: Second Floor

Randy Drury
20 Gable Place, Barre, VT 05641
802-477-5258 • randy@3Ethermal.org
www.3Ethermal.org

3E Thermal is a consulting and incentive program for owners of affordable apartment housing throughout Vermont. We analyze energy use, provide work scope recommendations, and review design, specs, and installed work. In short, we help navigate the complexities of energy retrofits—and pay cash incentives to help make them happen!

475 High Performance Building Supply

Silver Sponsor / Envelope Track
Booth: 6

John Rezvani
334 Douglass Street, Brooklyn, NY 11217
718-622-1600 • john@foursevenfive.com
www.foursevenfive.com

475 is the leader in simplified solutions for Passive House buildings in North America, providing air sealing, insulation, ventilation, daylighting elements, and more with knowledge and experience to back it up.

Accurate Dorwin

Lanyard Sponsor / Booth: Second Floor

Doug Nowlin
1535 Winnipeg, MB R3Y 1L9
204-982-8375 • dnowlin@accuratedorwin.com
www.accuratedorwin.com

Accurate Dorwin is a manufacturer of high-performance fiberglass windows.

Architectural Metal Supply

Booth: 21

Bob Reap
102 Willis Farm Road, Richmond, VT 05477
802-434-3435 • bob@archmetalsupply.com
www.archmetalsupply.com

Architectural Metal Supply offers a full range of metal trim, roof panels, and our patent pending skylight Ez-Curbs, making it easier for you to do metal roofs faster and with less hassle.

Blake Equipment Co.

Bronze Sponsor / Booth: Second Floor

Terry Randall
280 Quality Lane, Rutland, VT 05701
413-270-0052 • terry.randall@blakeequip.com
www.blakeequipment.com

We are a wholesale distributor, manufacturer, and manufacturer's rep of water systems, sewage, and hydronic products. Commercial, industrial, and residential.

BRINC Building Products, Inc.

Bronze Sponsor / Booth: Second Floor

John Brooks
1270 Route 66, New Bethlehem, PA 16242
814-227-9728 • jbrooks@brincbp.com
www.thermalbuck.com

BRINC Building Products, Inc. is the manufacturer of ThermalBuck, the high-performance window buck. Designed to solve the challenges of installing windows with continuous insulation, it extends the mounting point for windows and doors to create a flush plane for cladding, and insulates with an R-value of 4.4 per inch, limiting thermal bridging in the building envelope.

Broan

Booth 19

Steve Svien
926 West State Street, Hartford, WI 53027
262-673-4340 • steve.svien@broan.com
www.broan.com

Broan is North America's leading manufacturer of quiet fans, heat and energy recovery ventilators, and range hoods.

Building Energy

Booth: 43 + 44

Bob Murphy
1570 South Brownell Road, Williston, VT 05495
802-859-3384 x118 • bmurphy@buildingenergyus.com
www.buildingenergyus.com

Most of our insulation and energy improvement projects qualify for state incentives offered through current Efficiency Vermont programs. Our mission: We are committed to reducing the carbon footprint of buildings and converting to clean renewable energy. Our goal is to provide comprehensive solutions to complex energy problems by providing a wide range of building products and services.

Burlington Electric Department

Bronze Sponsor / Booth: Second Floor

Valerie DeBrita
585 Pine Street, Burlington, VT 05401
802-865-7342 • vdebrita@burlingtonelectric.com
www.burlingtonelectric.com

Burlington Electric Department serves the energy needs of the Burlington community in a safe, reliable, affordable, and socially responsible manner. Burlington was the first U.S. city to source 100% of its power from renewable generation, and BED works closely with its community partners to deliver cost-effective energy solutions on behalf of ratepayers.

Carroll Concrete

Booth: 30

Jeff Stocker
8 Reeds Mill Road, P.O. Box 1000, Newport, NH 03773
603-863-1000 • jstocker@carrollconcrete.us
www.carrollconcrete.com

A leading ready-mix concrete company with 17 ready-mix plants located across New Hampshire and Vermont. Carroll Concrete offers a wide variety of concrete products and services to complement its high-quality ready-mix concrete.

Charron Inc.

Booth: 59 + 60

Bill Curley
28 Maple Grove Street, Unit #1, Barre, VT 05641
802-734-0254 • bcurley@charroninc.com
www.charroninc.com

Charron Incorporated has been servicing Northern New England since 1960 with the industry's finest lighting products. We specialize in LED lighting and energy-efficient lighting control systems. We have the largest offering of DLC-listed products. Charron is a single source for quality lighting products.

Cree

Bronze Sponsor / Booth: Second Floor

Brian Kelly
4600 Silicon Drive, Durham, NC 27703
800-236-6800 • bkelly@acree.com
www.lighting.cree.com

Cree is a market-leading innovator of lighting-class LEDs, LED lighting, and semiconductor solutions for wireless and power applications. We are uniquely positioned to innovate new ways in which lighting will serve as a platform for emerging technologies and capabilities that will enrich lives, improve society, and safeguard our planet.

Curtis Lumber Co., Inc.

Booth: 36

Sara Manning
349 LeRoy Road, Williston, VT 05495
802-863-3428 • sara.manning@curtislumber.com
www.curtislumber.com

Family-owned home improvement store with 21 locations throughout New York and Vermont. Serving local communities for over 125 years.

Daikin

William Paige
19001 Kermier Road
Waller, TX 77484
972-245-1510
william.paige@daikincomfort.com
www.daikincomfort.com

Platinum Sponsor
Evening Reception on Wednesday
Booth: 51 + 52



Daikin is the world's number-one air conditioning company. Daikin is a leading innovator and worldwide provider of advanced, high-quality air conditioning and heating solutions for residential, commercial, and industrial applications

Emerson Swan, Inc.

Booth: 22 + 23

Todd Daniels
300 Pond Street, Randolph, MA 02368
781-986-2000 • tdaniels@emersonswan.com
www.emersonswan.com

Emerson Swan is a manufacturer's representative serving the Northeastern United States and the Greater Toronto Area (GTA) with quality residential and commercial plumbing, heating, and HVAC equipment for over 86 years.

DAIKIN
COMFORT FOR LIFE

Lower Utility Bills on Sale Now!

A Daikin brand ductless indoor comfort system can help lower your heating and cooling bills. It's like the utility company having a sale! Find out more from your local Daikin brand dealer.

Our continuing commitment to quality products may mean a change in specifications without notice.
© 2014 DAIKIN NORTH AMERICA LLC Houston, Texas · USA · www.daikincomfort.com

Energy Federation Inc. (EFI)

Silver Sponsor, Building Systems Track
Booth: 28

Jessica Kerr
1 Willow Street, Southborough, MA 01745
800-876-0660 • jdematos@efi.org
www.efi.org

EFI is the leader in distributing the latest in energy-efficient technology and a provider of utility program services with a mission to minimize energy and water usage.

Energy Management Consultants, Inc.

Booth: 12

Kayla Kunath
55 Industrial Way, Portland, ME 04103
207-767-1313 • kdhanson@emcinc-online.com
www.emcinc-online.com

Energy Management Consultants, Inc. (EMC) is a team of engineers, master electricians, certified energy managers, and lighting certified personnel completing design-build turnkey energy service projects. Our primary focus is on highly efficient lighting and advanced lighting controls.

Energy Panel Structures

Booth: 34

Crystal Nissen
603 N Van Gordon Avenue, Graettinger, IA 51342
712-859-3219 • cnissen@epsbuildings.com
www.epsbuildings.com

Pre-engineered buildings and tilt-up panel systems.

Flynn & Reynolds Agency, Inc.

Booth: 13 + 14

Lisa Lynch
1053 East Street, Tewksbury, MA 01876
978-454-1098 • lisa@flynn-reynolds.com
www.flynn-reynolds.com

Flynn & Reynolds Agency, Inc., represents Fantech, the leader in energy-efficient ventilation. We also represent ETi and Keystone, both of which design and manufacture LED lighting products for residential and commercial applications.

Foam Laminates of Vermont

Bronze Sponsor / Booth: Second Floor

Mark Driscoll
22 Varney Hill Road, Starksboro, VT 05487
802-453-3727 • mark@foamlaminates.com
www.foamlaminates.com

Foam Laminates of Vermont is a structural insulated panel (SIP) manufacturer.

Foard Panel Inc.

Booth: 25

Alison Moynihan
53 Stow Drive, West Chesterfield, NH 03466
603-256-8800 • alison@foardpanel.com
www.foardpanel.com

Foard Panel is a manufacturer and installer of structural insulated panels (SIPs). We pride ourselves on quality products and quality service, to make sure your building is airtight and durable.

Fujitsu General America

Booth: 20

Cameron Brown
24 Blanchard Road, Burlington, MA 01803
508-272-1553 • cbrown@fujitsugeneral.com
www.fujitsugeneral.com

A world leader in high-efficiency heating and cooling products, Fujitsu General America manufactures environmentally friendly products that provide a comfortable environment by using its continually improving air conditioning technology, innovation, and creativity.

GLAVEL, Inc.

Bronze Sponsor / Booth: Second Floor

Rob Conboy
106 Main Street, Suite 1W, Burlington, VT 05401
802-373-4606 • rob@glavel.com
www.glavel.com

Foam glass gravel is manufactured from cleaned, recycled glass. It is a lightweight aggregate proven to be an excellent product with multiple applications: building insulation, green roofs, bulk fill, frost heave insulation, and embankments. It is a cost-effective alternative to sub-slab rigid foam insulation. Lighter than other fill materials, it provides significant financial and environmental benefits for infrastructure projects.

Green Mountain Electric Supply

Booth: 58

Karen Laber
356 Rathe Road, Colchester, VT 05446
802-338-9336 • karenl@gmes.com
www.gmes.com

GMES is an innovative electrical wholesaler that has been servicing New England and New York since 1953. GMES is family owned and operated, with 14 branch locations doing daily local deliveries to customers. GMES specializes in alarm systems, PV solar layout and design, energy audits, and custom lighting layouts.

Gryphon Doors by New Frameworks Natural Design/Build

Booth: 11

Ben Graham
1 Mill Street, Suite 161, Burlington, VT 05401
802-448-2206 • ben@newframeworks.com
www.newframeworks.com/techniques/#doors-section

Gryphon Doors makes high-performance entry doors with low embodied carbon design. They are made from solid wood and natural insulating materials, ready for Passive House or zero-energy projects.

Huber Engineered Woods

Bronze Sponsor / Booth: Second Floor

Scott Johnston
10925 David Taylor Drive, Suite 300, Charlotte, NC 28262
207-219-0117 • scott.johnston@huber.com
www.zipsystem.com

An innovative panel that makes insulating wood frame structures simple, Zip System R-sheathing is where code meets comfort. Installation is a quick, two-step process that eliminates the need for additional exterior insulation and house wrap.

Kingspan Insulation LLC

Booth: 17

Cindy Barrett
2100 Riveredge Parkway, Suite 175, Atlanta, GA 30328
678-589-7319 • cindy.barrett@kingspan.com
www.kingspan.us

Kingspan Insulation LLC is a leading manufacturer in energy efficiency and moisture management products, offering high-performance insulation, building wraps, and pre-insulated HVAC ductwork. Kingspan Insulation is part of the Kingspan Group plc, a global leader in a range of product divisions including pre-insulated building panels, environmental technologies, and renewable energy technologies. Its products are among the most thermally efficient and technologically advanced insulation materials available.

LFD Solutions

Booth: 33

Jeff Mann
104 McKinley Road, Portsmouth, NH 03801
603-498-3421 • jeff@lfd-solutions.net
www.lfd-solutions.com

LFD Solutions provides product solutions to electrical distributors, solutions that include new and retrofit LED products and wireless lighting controls.

Loewen Window Center

Booth: 2

Steve Cary
52 Bridge Street, White River Junction, VT 05001
802-295-6555 • steve@loewenvtnh.com
www.loewenvtnh.com

We provide solution-oriented fenestration products for residential and light commercial projects requiring extraordinary thermal and DP values.



WEATHERIZATION WINTER SPECIAL

Stock up and **save 15% OFF** our featured winterization items.



SAVE \$40+
On 4 Cases



15% OFF
200' of Hose



SAVE \$85 on
a Set of 2 Kits

efi.org/wholesale

Use coupon code: **WINTER18**

800.876.0660 x1

Mention program: **WINTER18**

Discounts while supplies last so don't miss out on this opportunity to save.

GLAVEL
FOAM GLASS GRAVEL



Turning recycled glass into sustainable insulation

Foam glass gravel is manufactured from cleaned, recycled glass. It is a lightweight aggregate proven to be an excellent product with multiple applications: building insulation, green roofs, and bulk fill.

GLAVEL is a cost-effective alternative to sub-slab rigid foam insulation. It provides significant financial and environmental benefits for your energy efficient building projects.

www.GLAVEL.com

GLAVEL, Inc., 106 Main Street, Burlington, VT 05401, Phone: (802) 373-4606, Email: info@glavel.com

Minotair Ventilation Inc.

Booth: 10

Alex De Gagné
45 Rue de Villebois, Suite 300, Gatineau, QC J8T 8J7
1-855-888-2292 x6009 • alex.degagne@minotair.com
www.minotair.com

Minotair is the North American manufacturer of the first autonomous and most complete all-in-one HVAC solution for single dwellings and multifamily Passive House and other high-performance buildings: The PentaCare V12. Compact and quiet, this self-contained unit is installed indoors and fulfills the function of four useful machines: heat recovery ventilator (HRV) + heat pump + HEPA high-efficiency air filtration device (MERV15/F9) + dehumidifier.

Mitsubishi Electric Trane HVAC US LLC

Booth: 61

Michele Brigham
150 Cordaville Road, Suite 110, Southborough, MA 01772
508-281-4095 • mbrigham@hvac.me.com
www.metahvac.com

Mitsubishi Electric Trane HVAC is the leading marketer of residential and commercial ductless air-conditioning and VRF zoning systems in the United States.

**Murphy's
CELL-TECH LLC**Gold Sponsor, Wednesday Lunch
Booth: 53 + 54

John B. Unger Murphy
439 Cliff Street, St. Johnsbury, VT 05819
802-748-5800 • john@murphyscelltech.com
www.murphyscelltech.com

Murphy's CELL-TECH LLC is one of the original performance-oriented thermal envelope specialists with decades of experience achieving high-performance buildings. One stop for zero-energy building.

Needham Electric Supply

Booth: 15

Mary Ahlfeld
5 Shawmut Road, Canton, MA 02021
781-828-9494 • mary.ahlfeld@needhamelectric.com
www.needhamelectric.com

Needham Electric meets the lighting and electrical supply needs of contractors and builders; leading national retailers, hotels, automotive companies, supermarkets, and restaurant franchises; and commercial, institutional, and residential property managers, as well as the technical needs of OEMs.

New England Foam and Coating, Inc.

Booth: 56

Shannon Chapman
108 Concord Avenue, St. Johnsbury, VT 05819
802-748-5600 • newenglandfoam@myfairpoint.net
www.newenglandfoamandcoating.net

Opened in 2001, we are a company that specializes in closed and open cell spray foam insulation applications as well as cellulose insulation.

Panasonic

Silver Sponsor / Booth: 7

Gary Church-Smith
2 Riverfront Plaza, Newark, NJ 07102
866-292-7299 • gary.church-smith@us.panasonic.com
www.panasonic.com/ventfans

Panasonic is a global leader in providing ultra-energy-efficient, ultra-quiet ventilation and indoor air quality solutions for residential and light commercial applications.

Parksite

Gold Sponsor, Wednesday Breakfast / Booth: 46 + 47

Martin Petteys
455 Sullivan Avenue, P.O. Box 8, South Windsor, CT 06074
518-703-2268 • mpetteys@parksite.com
www.parksite.com

Parksite is a sales, marketing, and distribution company serving many segments of the building industry. We are proud to supply the best building material dealers with category-leading products for the residential, commercial, and remodeling markets. Parksite is a resource for the trades with a specialist network that provides consultative services and support for builders, architects, designers, remodelers, general contractors, and deck builders. We continue to research emerging products and are actively looking for products to fit new categories that will inevitably evolve as the building industry changes.

Pella Windows and Doors

Booth: 57

Jeff Stetter
340 Dorset Street, South Burlington, VT 05403
802-498-4682 • jstetter@pellasales.com
www.professional.pella.com

Providing customers the most well-designed, innovative, and highest-quality products and services before, during, and after the sale.

Pinnacle Window Solutions

Booth: 42

Kristopher Brill
17 Hope Drive, Hallowell, ME 04347
207-699-7171 • kris@pinnaclewindowsolutions.net
www.pinnaclewindowsolutions.net

Distributing high-performance window and door solutions throughout the Northeast.

Preferred Building Systems

Booth: 1

Bryan Huot
P.O. Box 1, 143 Twistback Road, Claremont, NH 03743
603-372-1050 • bhuot@preferredbuildings.com
www.preferredbuildings.com

We are innovators and leaders delivering high-performance modular homes. We produced what we believe to be the first modular Passive House in the United States.

RAB Lighting

Booth: 41

Bob Meade
170 Ludlow Avenue, Northvale, NJ 07647
201-784-8600 • bob@rabweb.com
www.rablighting.com

RAB Lighting is committed to creating high-quality, affordable, well-designed, and energy-efficient LED lighting and controls that make it easy for distributors to sell, electricians to install, and end-users to save energy.

rk MILES

Session Sponsor

Henry Miles
618 Depot Street, Manchester Center, VT 05255
802-549-5671 • marketing@rkmiles.com
www.rkmiles.com

rk MILES, founded in 1940, is a family-owned leader in providing services and materials for all types of building and design projects. We have six locations serving Vermont and Western Massachusetts.



The Front

FIGHTS AIR AND MOISTURE.



The Back

FIGHTS HEAT AND COLD.

Together, they knock out the elements.

ZIP System[®] R-sheathing is the simple all-in-one structural panel with built-in exterior insulation. Featuring integrated moisture, air and thermal protection, ZIP System R-sheathing completely reimagines traditional wall assemblies by streamlining the weatherization process. Learn how to protect your next project at [InsulateYourBuild.com](https://www.insulateyourbuild.com).

© 2019 Huber Engineered Woods LLC. ZIP System and the accompanying ZIP System logo and design are trademarks of Huber Engineered Woods LLC. Huber Engineered Woods products are covered by various patents. See [ZIPSystem.com/Patents](https://www.zipsystem.com/patents) for details. This product's Environmental Product Declaration (EPD) has been certified by UL Environment. HUB 81840 REV 1/19

Rockwool

Booth: 50

Pamela Jay
8024 Esquesing Line, Milton, ON L9T 6W3
905-875-5711 • pamela.jay@rockwool.com
www.rockwool.com

ROCKWOOL™ is part of the ROCKWOOL Group. With three factories and 900 employees, we are North America's largest stone wool producer, offering advanced building insulation as well as industrial and technical solutions.

RST Thermal

Booth: 32

Maryellen Hickey
372 University Avenue, Westwood, MA 02090
781-320-9910 • mehickey@rstthermal.com
www.rstthermal.com

Manufacturer's rep serving New England. We represent multiple leading manufacturers whose products offer a systems approach to comfortable heating, cooling, and ventilation.

Runtal North America

Booth: 39

Jon Wiberg
187 Neck Road, Ward Hill, MA 01835
800-526-2621 • jonathan.wiberg@runtalnorthamerica.com
www.runtalnorthamerica.com

Runtal Radiators developed the original European-style panel radiators more than 60 years ago in Switzerland. For over 30 years, we have operated a state-of-the-art factory in Haverhill, Massachusetts, to provide products for the American and Canadian markets. We manufacture hydronic, electric, and steam panel radiators and towel warmers.

Sierra Pacific Windows and Doors

Bronze Sponsor / Booth: Second Floor

William McMaster
11605 Reading Road, Red Bluff, CA 96080
530-527-9620 • bmcmaster@spi-ind.com
www.sierrapacificwindows.com

Sierra Pacific Windows is a division of Sierra Pacific Industries. We are an SFI-certified forestry management company providing high-quality lumber and millwork products internationally.

Siga Cover Inc.

Booth: 16

Marc Coviello
1229 N North Branch Street, Suite 310, Chicago, IL 60642
855-733-7442 • marc.coviello@siga.swiss
www.siga.swiss

Siga develops and manufactures high-performance, nontoxic adhesives, tapes, and membranes for creating airtight building envelopes.

SK & Associates

Booth: 27

Dave Viveiros
20 Carver Circle, Canton, MA 02021
802-318-6210 • dviveiros@sk-assoc.com
www.skandassociates.com

SK & Associates is one of the Northeast's most respected independent manufacturer's representatives, servicing all of New England for over 50 years. We offer outstanding service and comprehensive design assistance at no cost to our customers.

SunCommon

Booth: 24

Carrie Fenn
442 U.S. Route 2, Waterbury, VT 05676
802-398-5696 • carrie.fenn@suncommon.com
www.suncommon.com

SunCommon® believes that everyone has the right to a healthy environment and brighter future—and renewable energy is where it starts. Energy from the sun can power our lives and build vibrant communities. Our mission is to tear down barriers to clean energy and use our business as a force for good.

SunWood Biomass

Booth: 45

David Frank
1575 Center Fayston Road, Fayston, VT 05660
802-496-6666 • david@sunwoodbiomass.com
www.sunwoodbiomass.com

SunWood Biomass specializes in high-efficiency advanced wood heating systems. With over 260 commercial and residential installations since 2004, SunWood provides project development services including feasibility studies and financing, and a highly experienced installation team.

Thermostat Recycling Corporation

Booth: 18

Danielle Myers
500 Office Center Drive, Suite 400, Fort Washington, PA 19034
267-513-1726 • danielle.myers@thermostat-recycle.org
www.thermostat-recycle.org

TRC is a national nonprofit network of over 3,600 mercury thermostat collection sites. It has recovered more than 11 tons of mercury since its inception in 1998.

Turner Building Science

Booth: 26

Avery Hageman
27 Locke Road, Concord, NH 03301
603-228-1122 • ahageman@hltturner.com
www.turnerbuildingsscience.com

Turner Building Science & Design, LLC is a solutions-oriented team, dedicated to the development of healthy environments in new and existing buildings. We use our diverse building science backgrounds to create innovative, energy-efficient new designs and provide safe, comfortable indoor environments.

Unity Homes

Booth: 35

Andrew Dey
6 Blackjack Crossing, Walpole, NH 03608
603-756-3600 • andrew@unityhomes.com
www.unityhomes.com

Unity Homes uses off-site construction methods to build high-performance homes throughout the Northeast.

Urell

Booth: 37 + 38

Richard Fredette
86 Coolidge Avenue, Watertown, MA 02471
617-923-9500 • mleahy@urell.com
www.urell.com

Urell is the premier manufacturers' representative servicing New England and Upstate New York, in partnership with quality manufacturers and wholesale distribution.

DuPont™
Weatherization Systems



**Because craftsmanship
is alive and well**

We make DuPont™ Tyvek® Weatherization Systems for pros who take pride in what they do. After all, you have helped make us the industry leader **for over 25 years**. *And you're the reason why we continue to develop innovative products, systems and services like DuPont™ Flashing Systems for superior protection against water intrusion and the DuPont™ Tyvek® Specialist Network. DuPont™ Tyvek® Weatherization Systems*—they're all about making a tough job easier and helping you build an even stronger reputation for quality.

For more information contact:

Martin Petteys
(518) 703 2268 • mpetteys@parksite.com

distributed by  **Parksite**



MURPHY'S

ZERO ENERGY BUILDING INC



MURPHY'S

CELL-TECH LLC

Keep It Simple
It Costs Less
Highest Performance
Guaranteed

John B. Unger Murphy
St. Johnsbury, VT 05819
Ofc. Ph: (802) 748-5800
Email: John@ZEBuilding.com

Vermont B/A Magazine

Bronze Sponsor / Booth: Second Floor

Dick Nelson
P.O. Box 1076, White River Junction, VT 05001
603-448-6707 • dicknelson1224@gmail.com

Vermont B/A is a 25-year-old full-color, quarterly publication for the building trades, sent cost-free to approximately 2,000 builders, architects, remodelers, and other building professionals in Vermont and Western New Hampshire.

Vermont Business Magazine

Bronze Sponsor / Booth: Second Floor

John Boutin
365 Dorset Street, South Burlington, VT 05403
802-863-8038 • john@vermontbiz.com
www.vermontbiz.com

Vermont's only statewide business news, economic, and political monthly magazine; and three annual publications: *Vermont Manufacturers Directory*; *Book of Lists*, and *Profiles in Business*.

Vermont DEC Waste Management and Prevention Division

Booth: Second Floor

Karen Knaebel
1 National Life Drive, Montpelier, VT 05620-3704
802-522-5736 • karen.knaebel@vermont.gov
www.dec.vermont.gov/waste-management

We will be presenting on free recycling programs for electronics, batteries, paint, mercury lamps, and mercury thermostats. Also, information on construction waste and options for disposal.

Vermont Department of Health

Booth: Second Floor

Marielle Strong
108 Cherry Street, Burlington, VT 05402
802-865-7742 • marielle.strong@vermont.gov
www.healthvermont.gov

The Vermont Department of Health encourages builders to use radon-resistant new construction (RRNC). RRNC can help reduce the occurrence of lung cancer caused by radon exposure.

Vermont Eco-Floors

Bronze Sponsor / Booth: Second Floor

Karen Frost
260 Ferry Road, Charlotte, VT 05445
802-425-7720 • contactus@vermontecofloors.com
www.vermontecofloors.com

Vermont Eco-Floors uses local stone aggregates, diamond-grinding technology, dyes, and sealers to create polished concrete floors that are beautiful, durable, and easy to maintain. Our environmentally friendly floors have contributed to successful green building projects throughout Vermont and New England. Visit our gallery to see examples of our fine work.

Vermont Energy Contracting & Supply

Booth: 40

Mark Stephenson
188 Krupp Drive, Williston, VT 05495
802-658-6055 • mark@vtenergy.com
www.vtenergy.com

Residential and light commercial HVAC contractor. Specializing in heat pump technology.

Vermont Energy Investment Corporation

Jim Madej
128 Lakeside Ave, Suite 401
Burlington, VT 05401
800-639-6069 • jmadej@veic.org
www.veic.org

VEIC is a leader in the design and delivery of energy efficiency and renewable energy services for residents, businesses, and industrial customers.

Platinum Sponsor
Blair Hamilton Scholarship Lunch



Vermont Gas Systems

Platinum Sponsor
Evening Reception on Wednesday
Booth: 4 + 5

Beth Parent
85 Swift Street
South Burlington, VT 05403
802-863-4511
bparent@vermontgas.com
www.vermontgas.com



We are Northwest Vermont's integrated energy services company. We offer customers clean, affordable, and reliable natural gas service, award-winning energy efficiency programs, home and business energy equipment service and maintenance, and a renewable option for families and businesses.

Vermont Insulated Concrete Forms

Booth: Second Floor

Joel Baker
P.O. Box 531, Waterbury, VT 05676
802-793-0673 • vticf@aol.com
www.vticf.com

VTICF is Vermont's foremost distributor of ICF building products. We are exclusive distributors of Arvic's innovative line of EPS insulation solutions, and have been serving Vermont and Northern New Hampshire for over 18 years.

Vermont Passive House Inc.

Booth: 3

Chris Miksic
1526 Lower Road, Plainfield, VT 05667
802-249-1052 • chris@montpelierconstruction.com
www.vtph.org

Vermont Passive House is an independent nonprofit corporation dedicated to the advancement of and education about the Passive House standard in the U.S. We are a group of about 70 building professionals, architects, builders, consultants, designers, and members of the general public who represent about 50 businesses in and around Vermont. We are all working toward creating sustainable buildings by employing Passive House methodologies.

VHV Company

Booth: 29

Mallory Fischer
16 Tigan Street, Winooski, VT 05404
802-655-8805 • mfischer@vhv.com
www.vhv.com

VHV is a full-service mechanical and plumbing contractor including a specialty in clean room construction. Since 1949 VHV has been serving New England; it is a one-stop shop for mechanical services.

Save money and stay cozy all year long.

**Sign up for a free
energy audit today.**



Vermont Gas

VermontGas.com

Viessmann Manufacturing Company (U.S.) Inc.

Booth: 55

Kevin Flynn
45 Access Road, Warwick, RI 02886
401-732-0667 • flyk@viessmann.com
www.viessmann.com

Viessmann Manufacturing provides high-efficiency gas and oil boilers, indirect domestic hot water tanks, thermal-solar systems, and biomass wood pellet and chip boilers.

Visible Light

Booth: 48 + 49

Scott Kimball
11 Meadow Lane, Meredith, NH 03253
603-918-6496 • skimball@visible-light.net
www.visible-light.net

We are a company providing design and sales service on lighting and lighting controls projects throughout Maine, New Hampshire, and Vermont.

VSECU

Booth: Second Floor

Laurie Fielder
P.O. Box 67, Montpelier, VT 05601
802-371-5162 • lfielder@vsecu.com
www.vsecu.com

A credit union inspiring a movement that brings people together to empower the possibilities for greater financial, environmental, and social prosperity.

Windows & Doors By Brownell

Booth: 8 + 9

Jackie Turtur
800 Marshall Avenue, Williston, VT 05495
802-862-4800 • jackie@wdbrownell.com
www.wdbrownell.com

Windows & Doors By Brownell is a family-owned business committed to the retail and installed sales of Marvin Windows and Doors, since 1991. Our goal is to provide excellent customer service and the best quality products possible.

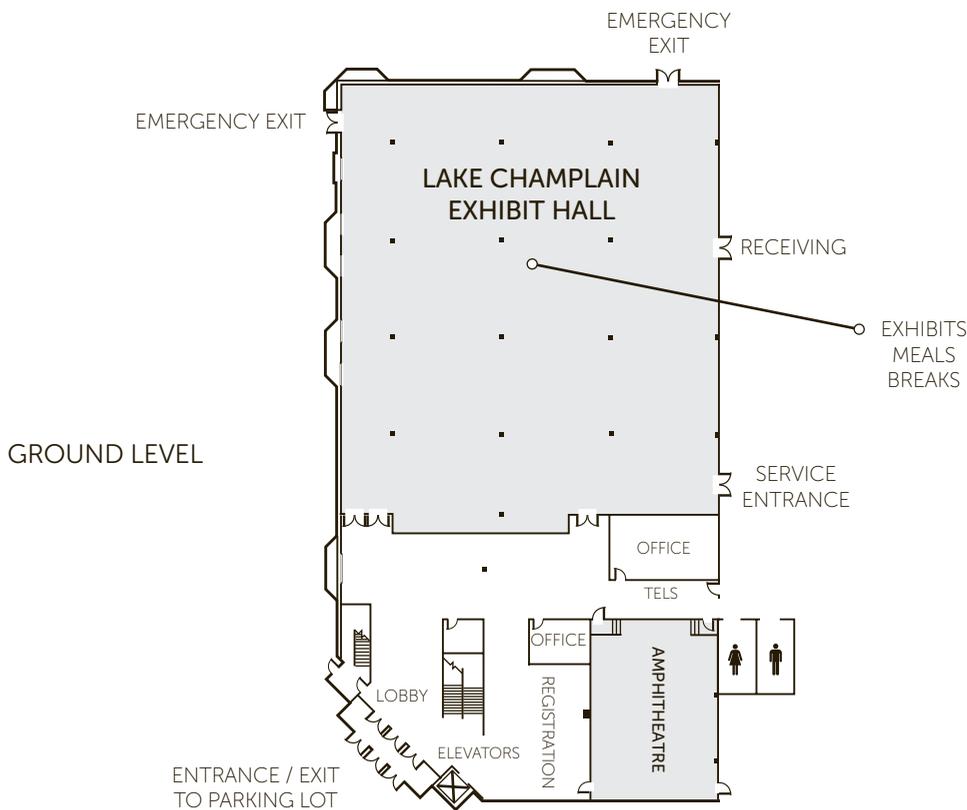
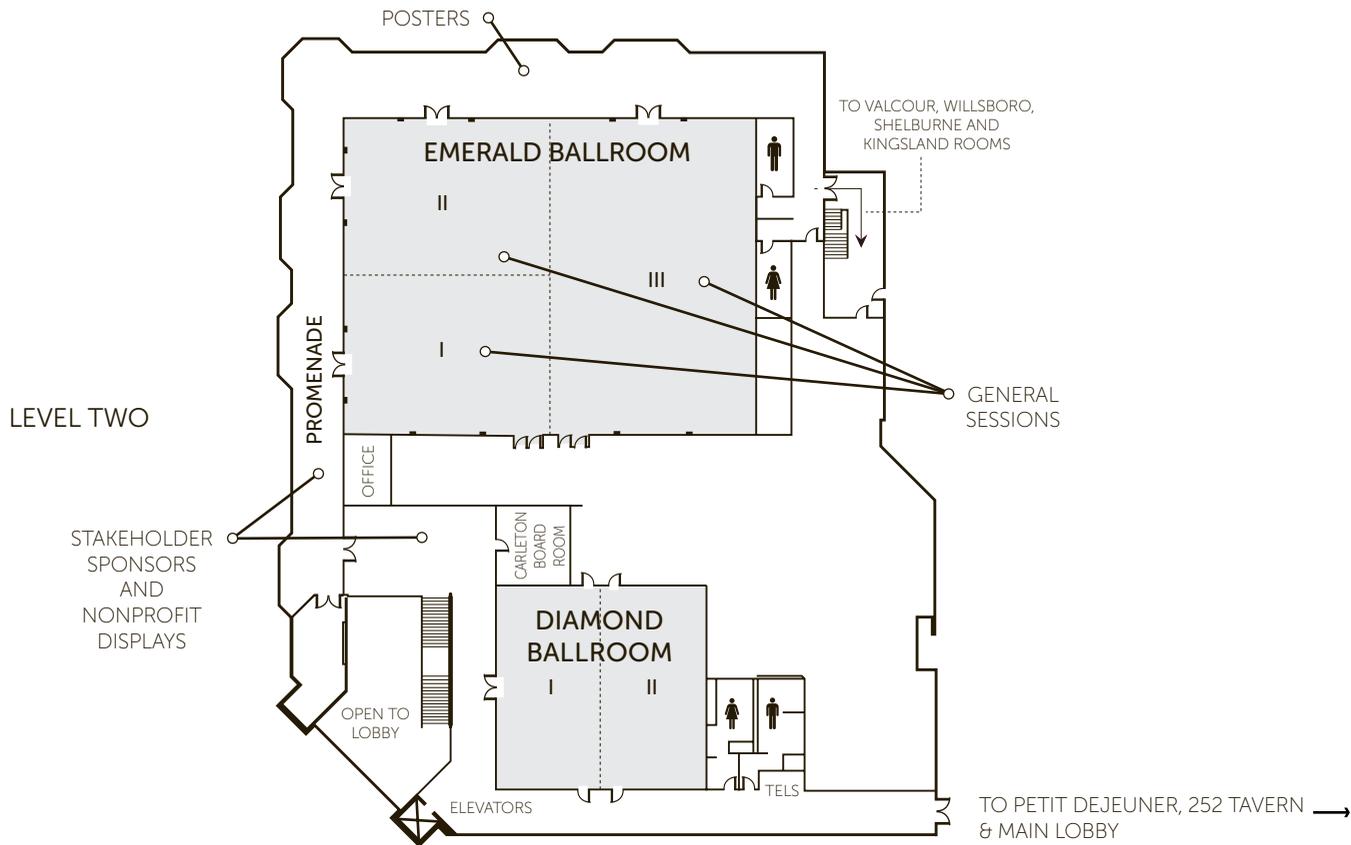
Zone 6 Energy

Booth: 31

Nate Gusakov
46 River Road, New Haven, VT 05472
802-324-1493 • goose@zone6energy.com
www.zone6energy.com

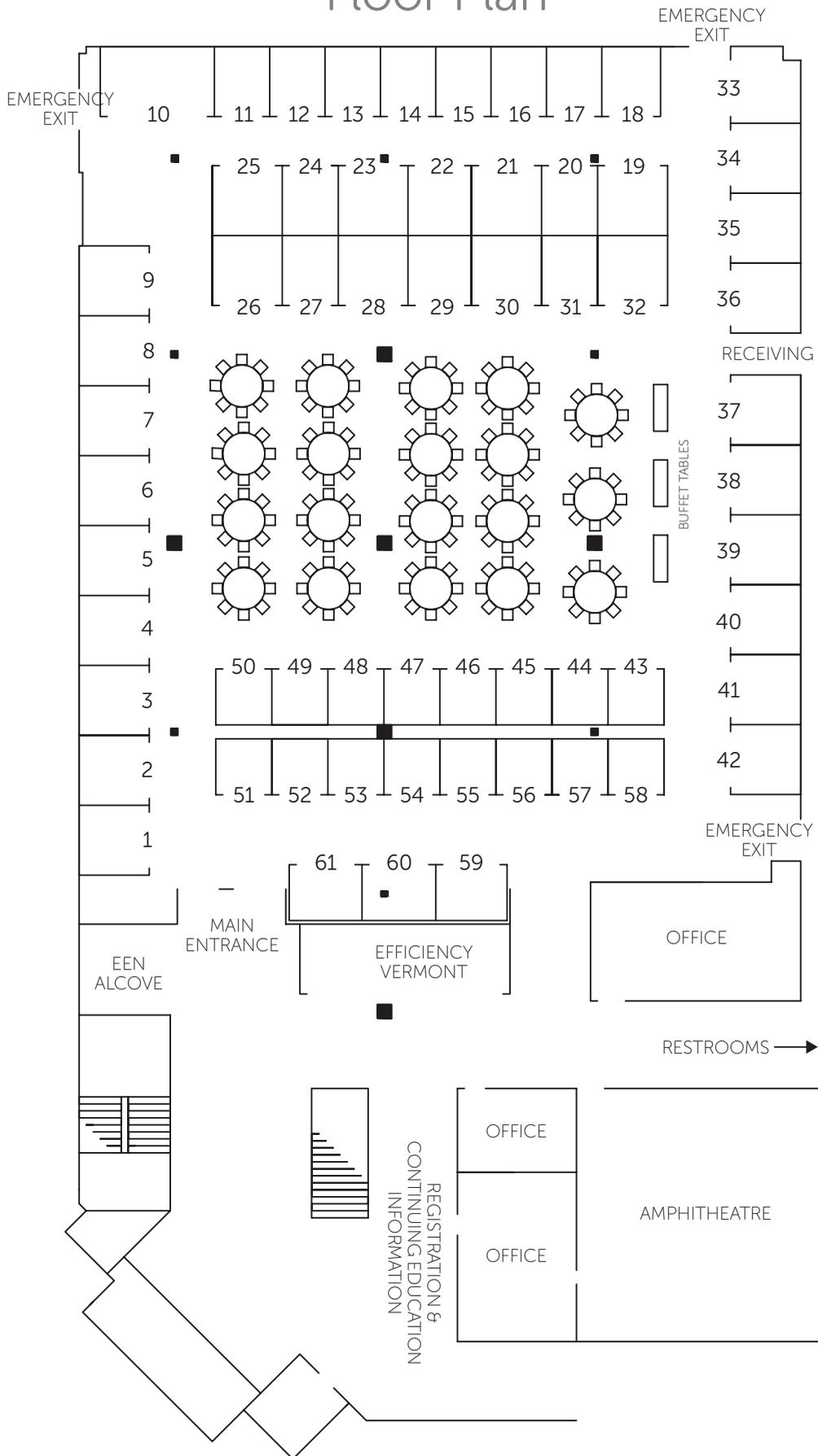
Zone 6 Energy specializes in air-sealing buildings in the dynamic climate of the Northeast United States. We offer BPI certified blower door testing and leakage diagnostics, installation of air-sealing measures including AeroBarrier, and full test-out and documentation to ensure that your buildings meet all necessary code requirements for airtightness.

Hotel Floor Plan



CONCURRENT WORKSHOPS will be held in Emerald I, II, and III, Diamond I and II, and the Amphitheatre. See Agenda (page 5) and Workshop Schedule (page 6) for details.

Lake Champlain Exhibit Hall Floor Plan



3E Thermal	2nd Floor
475 High Performance Building Supply	6
Accurate Dorwin	2nd Floor
Architectural Metal Supply	21
Blake Equipment Co.	2nd Floor
BRINC Building Products, Inc.	2nd Floor
Broan	19
Building Energy	43 + 44
Burlington Electric Department	2nd Floor
Carroll Concrete	30
Charron Inc.	59 + 60
Cree	2nd Floor
Curtis Lumber Co. Inc.	36
Daikin	51 + 52
Emerson Swan, Inc.	22 + 23
Energy Federation Inc. (EFI)	28
Energy Management Consultants, Inc.	12
Energy Panel Structures	34
Flynn & Reynolds Agency, Inc.	13 + 14
Foam Laminates of Vermont	2nd Floor
Foard Panel Inc.	25
Fujitsu General America	20
GLAVEL, Inc.	2nd Floor
Green Mountain Electric Supply	58
Gryphon Doors by New Frameworks Natural Design/Build	11
Huber Engineered Woods	2nd Floor
Kingspan Insulation LLC	17
LFD Solutions	33
Loewen Window Center	2
Minotair Ventilation Inc.	10
Mitsubishi Electric Trane HVAC US LLC	61
Murphy's CELL-TECH LLC	53 + 54
Needham Electric Supply	15
New England Foam and Coating, Inc.	56
Panasonic	7
Parksite	46 + 47
Pella Windows and Doors	57
Pinnacle Window Solutions	42
Preferred Building Systems	1
RAB Lighting	41
Rockwool	50
RST Thermal	32
Runtal North America	39
Sierra Pacific Windows and Doors	2nd Floor
SIGA Cover Inc.	16
SK & Associates	27
SunCommon	24
SunWood Biomass	45
Thermostat Recycling Corporation	18
Turner Building Science	26
Unity Homes	35
Urell	37 + 38
Vermont B/A Magazine	2nd Floor
Vermont Business Magazine	2nd Floor
Vermont DEC Waste Management and Prevention Division	2nd Floor
Vermont Department of Health	2nd Floor
Vermont Eco-Floors	2nd Floor
Vermont Energy Contracting & Supply	40
Vermont Gas Systems	4 + 5
Vermont Insulated Concrete Forms	3
Vermont Passive House Inc.	2nd Floor
VHV Company	29
Viessmann Manufacturing Company (U.S.) Inc.	55
Visible Light	48 + 49
VSECU	2nd Floor
Windows & Doors By Brownell	8 + 9
Zone 6 Energy	31



Platinum Level Sponsors



Gold Level Sponsors

Murphy's CELL-TECH LLC
Parksite

Silver Level Sponsors

475 High Performance Building Supply
Energy Federation Inc. (EFI)
Panasonic

Bronze Level Sponsors

Blake Equipment Co.
BRINC Building Products, Inc.
Burlington Electric Department
Cree
Foam Laminates of Vermont
GLAVEL, Inc.
Huber Engineered Woods
Sierra Pacific Windows and Doors
Vermont B/A Magazine
Vermont Business Magazine
Vermont Eco-Floors

Lanyard Sponsor

Accurate Dorwin

Exhibitors

Architectural Metal Supply
Broan
Building Energy
Carroll Concrete
Charron Inc.
Curtis Lumber Co. Inc.
Emerson Swan, Inc.
Energy Management Consultants, Inc.
Energy Panel Structures
Flynn & Reynolds Agency, Inc.
Foard Panel Inc.
Fujitsu General America
Green Mountain Electric Supply
Gryphon Doors by New Frameworks
Natural Design/Build
Kingspan Insulation LLC
LFD Solutions
Loewen Window Center
Minotair Ventilation Inc.
Mitsubishi Electric Trane HVAC US LLC
Needham Electric Supply
New England Foam and Coating, Inc.
Pella Windows and Doors
Pinnacle Window Solutions
Preferred Building Systems
RAB Lighting
Rockwool
RST Thermal
Runtal North America
SIGA Cover Inc.

SK & Associates
SunCommon
SunWood Biomass
Thermostat Recycling Corporation
Turner Building Science
Unity Homes
Urell
Vermont Insulated Concrete Forms
VHV Company
Viessmann Manufacturing Company
(U.S.) Inc.
Visible Light
Windows & Doors By Brownell
Zone 6 Energy

Session Sponsor

rk MILES

Nonprofit Exhibitors

3E Thermal
Vermont Department of Health
Vermont DEC Waste Management and
Prevention Division
Vermont Passive House Inc.
VSECU

Thank You!

