



Program

February 5 & 6, 2020
DoubleTree by Hilton Hotel
South Burlington, VT

**2020 Theme:
Affordable Energy**



Efficiency
Vermont

Highlights



By working with Efficiency Vermont and our network of building professionals, Vermonters have achieved tremendous impacts.

Benefits to Vermonters over the lifetime of their 2000-2018 investments in efficient equipment and building improvements.



17.7 million MWh
saved

The electricity it takes to power 184,000 homes for 10 years



11 million metric tons
pollutants avoided



\$2.4 billion
saved by
Vermonters



25 million MMBtu
saved

The fuel it takes to heat 28,000 homes for 10 years



The equivalent of
242,000
fewer cars
for 10 years

Look for more from the *2018 Efficiency Vermont Executive Summary* throughout this program.



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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.


Exhibit Hall

Stop by the exhibit hall and talk with more than 70 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.

Electric Vehicle Test Drive

Curious about electric vehicles? Six will be available to test drive throughout the conference. Stop by the Electric Vehicle information booth in the Conference Center Lobby to learn more and take one for a spin.

While the Better Buildings by Design conference is hosted by Efficiency Vermont, the views of session speakers are their own. The content of any session presentations do not necessarily reflect any policy or position of Efficiency Vermont, and presentations do not reflect an endorsement of any speaker, any policy, or any mentioned products, manufacturers, technologies, or opinions.

 Follow us! Better Buildings by Design 2020 on Twitter. #BBD20

Welcome

Welcome to Better Buildings by Design 2020, the region's premier building industry conference!

This year's theme is "Affordable Energy." Access to the right kind of energy—equitable, affordable, reliable, and sustainable—is essential for growing the state's economy and addressing climate change. Many Better Buildings by Design 2020 presenters will discuss their efforts to accelerate the transition to just such an energy system for all Vermonters. Over the next two days, 40-plus workshops will be offered in which attendees will learn about success stories, visions for the future, and strategies for overcoming barriers to affordable energy.

This year's conference kicks off at 8:30 am on Wednesday, February 5, with the keynote address, "Carbon Drawdown Now: Turning Buildings into Carbon Sinks," presented by Chris Magwood of the Endeavour Centre in Peterborough, Ontario, and Jacob Racusin and Ace McArleton of New Frameworks in Burlington, Vermont.

The workshops that follow will be in four learning tracks: Building Systems, Commercial, Crossroads, and Enclosure. A sampling of workshops: "Fossil Fuel Free at Last: Air-to-Water Heat Pump and Ventilation Retrofit," "Construction Phase Carbon Impact," "Innovations in Zero Energy Modular (ZEM)," and "Healthy Homes & Home Performance: Making the Homeowner Connection." 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 2020 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 Vermont, Better Buildings by Design is the place to make connections, investigate new practices and technologies, and begin planning any building or renovation project for 2020.

Questions?

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

Agenda

Wednesday, February 5










| | | |
|------------------|---|---|
| 7:00 am | Exhibit Hall opens for registration and breakfast | |
| 8:30–10:00 am | Opening Session: Emerald Ballroom | Welcome 2020 Efficiency Vermont Awards Keynote Address by Chris Magwood, Ace McArleton, and Jacob Deva Racusin |
| All Day | The Efficiency Excellence Network: One-on-One Social Media Consulting in Catamount Boardroom (open to EEN members only; advance registration required) | |
| 10:00–10:20 am | Refreshment break in Lake Champlain Exhibit Hall (Break sponsored by Rettig USA d.b.a. Myson) | |
| 10:20–11:50 am | Workshops | |
| 10:30–11:30 am | Bosch Inverted Ducted Split System Heat Pumps in Providence Boardroom | |
| 11:50 am–1:20 pm | Lunch in Lake Champlain Exhibit Hall & Petit Dejeuner | |
| 12:15–1:00 pm | The Efficiency Excellence Network: An Overview of Benefits and Requirements in Providence Boardroom* | |
| 1:20–2:50 pm | Workshops | |
| 1:30–2:30 pm | Drain Water Heat Recovery Technology and Application Review with Case Studies in Providence Boardroom | |
| 2:50–3:15 pm | Refreshment break in Lake Champlain Exhibit Hall (Break sponsored by Rettig USA d.b.a. Myson) | |
| 3:15–4:45 pm | Workshops | |
| 3:30–4:30 pm | Innovations in Water Heating in Providence Boardroom | |
| 4:00–7:00 pm | Exhibit Hall open to public | |
| 4:45–7:00 pm | Evening reception in Lake Champlain Exhibit Hall—all welcome to attend (Reception sponsored by DuBois & King, Inc., Vermont Gas Systems, and Windows & Doors By Brownell) | |














Thursday, February 6

| | | |
|-------------------|---|--|
| 7:30 am | Exhibit Hall opens for registration and breakfast | |
| All Day | The Efficiency Excellence Network: One-on-One Social Media Consulting in Catamount Boardroom (open to EEN members only; advance registration required) | |
| 9:00–10:30 am | Workshops | |
| 9:30–10:30 am | Submitting Home Performance with ENERGY STAR® (HPwES) Projects through the Online Rebate Center in Providence Boardroom (open to HPwES contractors and OON contractors interested in joining HPwES) | |
| 10:30–11:00 am | Refreshment break in Lake Champlain Exhibit Hall | |
| 11:00 am–12:00 pm | Best Practices for ZIP System and ZIP System R Sheathing Installation in 252 Tavern | |
| 11:00 am–Noon | Workshops | |
| 12:30–1:45 pm | Lunch in Lake Champlain Exhibit Hall & Petit Dejeuner | |
| 12:45–1:30 pm | The Efficiency Excellence Network: An Overview of Benefits and Requirements in Providence Boardroom* | |
| 1:30–3:30 pm | Exhibit Hall open to public | |
| 1:45–3:15 pm | Workshops | |
| 2:00–3:00 pm | Refrigeration Refresher and Heatcraft Controls in Providence Boardroom | |
| 3:15–3:30 pm | Refreshment break in Lake Champlain Exhibit Hall | |
| 3:30–5:00 pm | Workshops | |
| 3:30 pm | 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> ENCLOSURE</p> <p>Fixing Existing Homes (Part 1) Residential Intermediate Emerald III</p> <hr/> <p>Quality Assurance for Low-Pressure Disposable Foam Systems Residential Intermediate Emerald II</p> <hr/> <p>Understanding Basic Dew Point Calculations for High-Performance Basement, Walls, and Roof Systems Residential Introductory Emerald I</p> <hr/> <p> CROSSROADS</p> <p>Solar Fire Investigation Analysis: The Unintended Consequence of Reflective Low-E Glass Technology Commercial Intermediate Amphitheatre</p> <hr/> <p> COMMERCIAL</p> <p>Construction Phase Carbon Impact Commercial Intermediate Diamond I</p> <hr/> <p>When Persistence Pays Off: A Retrospective of Early Adoption of ASHRAE Guideline 36 Commercial Advanced Diamond II</p> | <p> ENCLOSURE</p> <p>Fixing Existing Homes (Part 2) Residential Intermediate Emerald III</p> <hr/> <p>A Case Study on an Urban-Infill, Net-Positive, Foam-Free Passive House Project Residential Intermediate Diamond II</p> <hr/> <p>Doing Better for Less: R-30 Walls and Beyond—High Performance, Less Cost Residential Intermediate Emerald I</p> <hr/> <p> BUILDING SYSTEMS</p> <p>The Future of Water Heating: Hybrid Water Heaters, Smart Home Applications, and Grid Optimization Residential Introductory Emerald II</p> <hr/> <p>Ensuring Your Energy Remains Affordable, Using Existing Data for Energy Optimization Commercial Intermediate Amphitheatre</p> <hr/> <p> COMMERCIAL</p> <p>Selling Lower-Cost High-Performance Building Envelopes Commercial Advanced Diamond I</p> | <p> ENCLOSURE</p> <p>Encouraging Building Airtightness: A New Five-Story Building in Maine Commercial Intermediate Emerald I</p> <hr/> <p> BUILDING SYSTEMS</p> <p>Deep and Holistic Energy Efficiency Applications Commercial Intermediate Amphitheatre</p> <hr/> <p>Drill, Baby, Drill! Residential Geothermal: Can it Scale? Residential Introductory Diamond I</p> <hr/> <p>Lessons from Large-Scale Hippie Design-Build Projects in the 1970s Residential Intermediate Emerald II</p> <hr/> <p> CROSSROADS</p> <p>Innovations in Zero Energy Modular (ZEM) Residential Intermediate Emerald III</p> <hr/> <p>Demystifying Digital Marketing: What Tactics Work for Home Performance and What Should You Be Spending? Residential Introductory Diamond II</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> ENCLOSURE</p> <p>The Evolution of Mid-Rise Design: Increasing Opportunities with Wood</p> <p>Commercial Intermediate Amphitheatre</p> <hr/> <p>Healthy Homes and Home Performance: Making the Homeowner Connection</p> <p>Residential Introductory Emerald II</p> <hr/> <p> BUILDING SYSTEMS</p> <p>2020 HVAC, a Showcase of Emerging Systems</p> <p>Residential Intermediate Emerald III</p> <hr/> <p> CROSSROADS</p> <p>Ensuring Demand for Efficiency Over Time: Energy Education in Vermont</p> <p>Residential Introductory Diamond I</p> <hr/> <p> COMMERCIAL</p> <p>Lean Thinking Applied to All Energy Usage</p> <p>Commercial Intermediate Diamond II</p> <hr/> <p>Non-Energy Benefits—Three Exciting New Programs at Efficiency Vermont</p> <p>Commercial Intermediate Emerald I</p> | <p> ENCLOSURE</p> <p>Water, Vapor, Air: How Physics Can Help You Choose the Right Membrane</p> <p>Residential Intermediate Emerald III</p> <hr/> <p>How to Draw Down Carbon Now with Our Buildings: Practical Solutions and Design Strategies (Part 1)</p> <p>Residential Intermediate Emerald II</p> <hr/> <p> BUILDING SYSTEMS</p> <p>Good Enough—Hitting the Energy Jackpot</p> <p>Residential Introductory Diamond II</p> <hr/> <p>Fossil Fuel Free at Last: Air-to-Water Heat Pump and Ventilation Retrofit</p> <p>Residential Intermediate Emerald I</p> <hr/> <p> CROSSROADS</p> <p>Solar Roofing—A Better Way to Go Solar</p> <p>Residential Intermediate Amphitheatre</p> <hr/> <p>Grid-Connected Homes and Businesses</p> <p>Residential / Commercial Introductory Diamond I</p> | <p> ENCLOSURE</p> <p>Fuzzy Solutions: Safe, High-performance Enclosures with No Foam</p> <p>Residential Intermediate Emerald III</p> <hr/> <p>How to Draw Down Carbon Now with Our Buildings: Practical Solutions and Design Strategies (Part 2)</p> <p>Residential Intermediate Emerald II</p> <hr/> <p>The Ghosts Among Us—Reducing Air Infiltration from the Darkest Recesses to Dramatically Improve Comfort and Energy Performance</p> <p>Residential Introductory Diamond II</p> <hr/> <p> BUILDING SYSTEMS</p> <p>Energy Efficiency Upgrades for Addison Northwest School District Save Taxpayers Money</p> <p>Commercial Intermediate Diamond I</p> <hr/> <p>Zero Energy Now—Vermont’s Existing Homes Solution</p> <p>Residential Intermediate Emerald I</p> <hr/> <p> CROSSROADS</p> <p>Solar Plus—Electrifying Our Lives Provides a Better ROI</p> <p>Residential Intermediate Amphitheatre</p> | <p> ENCLOSURE</p> <p>Net-Zero Lessons Learned: Design, Construction, and Two Years of Living in a High-Performance Home</p> <p>Residential Intermediate Emerald III</p> <hr/> <p> BUILDING SYSTEMS</p> <p>Want to Save Energy? It’s about the Outside Air!</p> <p>Commercial Intermediate Amphitheatre</p> <hr/> <p>Pellet Stoves—The Renewable, Affordable, Hygge Heating Solution That’s Available Now</p> <p>Residential Introductory Diamond I</p> <hr/> <p> COMMERCIAL</p> <p>Better Buildings through Better Chemistry</p> <p>Commercial Intermediate Emerald I</p> <hr/> <p>Flexible Load Management: Results from the Green Mountain Power FLM Pilot</p> <p>Commercial Intermediate Diamond II</p> <hr/> <p>The Environmental Impact of Refrigerants: Past, Present, and Future</p> <p>Commercial Introductory Emerald II</p> |

Workshops

DAY 1: FEBRUARY 5, 2020

10:20 AM–11:50 AM CONCURRENT WORKSHOPS

✉ Fixing Existing Homes (Part 1) R / Intermediate EMERALD III

David Keefe—Efficiency Vermont

In 2008, Vermont adopted a goal to weatherize 80,000 homes by 2020, with average 25% savings. We are woefully behind. Currently we fix roughly 2,000 homes per year, with average savings of less than 25%. In this session, the presenter will outline how this work is done, what opportunities exist for doing more of it, and how we can do it better. We'll start with some lessons about indoor air quality, carbon monoxide, ventilation, and moisture learned over the 30 or so years that the weatherization industry has existed. We will discuss the state of the diagnostics art, the tools and techniques we use to figure out what to do. Then we will move to the hands-on work itself, practical things we are doing in Vermont homes to make them work better. We will wrap up with some challenges that the industry faces, including staffing and sales. This session is appropriate for those already doing this work, those considering getting into it, and anyone who wants to better understand how it is done.

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

† Solar Fire Investigation Analysis: The Unintended Consequence of Reflective Low-E Glass Technology C / Intermediate AMPHITHEATRE

Curt M. Freedman—CMF Engineering, Inc.

Low-E glass windows are also referred to as insulated glass units (IGU). In this session, the presenter will explain how a combination of factors can result in the IGUs becoming concave and parabolic in shape. The reflective metallic coating causes the IGUs to reflect concentrated sunlight with focal lengths of 15–60 feet. It has been determined that the concentrated reflected light of three times direct sunlight could easily melt vinyl siding, and 12 times direct sunlight could ignite fires, with corresponding absorbed blackbody temperatures of more than 532 degrees F.

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

✉ Quality Assurance for Low-Pressure Disposable Foam Systems R / Intermediate EMERALD II

Henri Fennell Jr.—HC Fennell Consulting, LLC

One-part and two-part portable foam systems (“kits and cans”) are used by do-it-yourselfers, contractors, and spray foam installers alike. These versatile disposable products allow users to do small or intermittent applications where bulk foam installations are not cost-effective, or in remote locations where using bulk foam is not possible. In this session, how these systems work and why they can be problematic will be discussed in detail. Instruction about how to properly prepare and use kits and cans will be provided, along with photos and demonstrations of accessories that improve their efficiency and effectiveness, while maintaining product quality and convenience.

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

✉ Understanding Basic Dew Point Calculations for High-Performance Basement, Walls, and Roof Systems R / Introductory EMERALD I

David Johnston—David Johnston & Co.
William Turner—Maine Indoor Air Quality Council

The presentation will focus on explaining what’s involved in a dew point (condensation point) calculation in a proposed basement, wall, or roof system and the very basic practical approach for doing the calculation. More advanced methods will also be covered. The attendee should come away with a basic understanding of the risk of failure involved with constructing high-performance walls for cold climates and why careful consideration is needed if building science rules of thumb, or detailed code prescriptive standards, are not followed.

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

🏢 Construction Phase Carbon Impact C / Intermediate DIAMOND I

Megan Nedzinski—Vermont Integrated Architecture, PC
Ashar Nelson—Vermont Integrated Architecture, PC
Amy Sheldon—Landslide Inc.

Our region has made great strides in advancing high-performance, zero-energy building practices; however, construction projects rarely quantify, or even consider, carbon during construction. Current Vermont policy initiatives and programs continue to push projects to meet 2050 climate goals (Act 250, Tier III programs, etc.) while project delivery decisions remain blind to community and environmental impacts, staying focused on time and money. Presenters will share insights into current policy initiatives and programs, lead an interactive discussion of key construction phase carbon considerations, and demonstrate how greater consideration of these key elements could help shift owners’ construction stage decision making toward positive change in a more holistic way.

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

KEY TO WORKSHOP TRACKS

🔧 Building Systems
Sponsored by Zehnder America

🏢 Commercial

† Crossroads

✉ Enclosure
Sponsored by Parksite

R = Residential C = Commercial



**When Persistence Pays Off:
A Retrospective of Early Adoption
of ASHRAE Guideline 36**

Henry Stehmeyer—Cx Associates

ASHRAE's Guideline 36 standard HVAC sequences of operations reduce engineering time, increase energy savings, improve indoor air quality, and normalize terminology and concepts between trades. Three years ago, UVM Medical Center implemented these sequences at its Fanny Allen building. Now in: the results from that implementation, the energy savings, and the lessons learned. Participants can hear the story and see the results presented by ownership and implementers. HVAC controls sequence refinement is an efficiency measure with big potential to move the industry toward efficiency goals by producing persistent energy savings.

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

C / Advanced
DIAMOND II

**The Future of Water Heating:
Hybrid Water Heaters, Smart Home
Applications, and Grid Optimization**

Diane Cabral—Rheem Water Heaters

Heat pump technology has been around for decades. This presentation will discuss why heat pump water heaters are often the best electric water heater solution in both residential and multifamily applications. Attendees will learn how hybrid heat pump water heaters function and discover the added benefits they bring. With built-in Wi-Fi connectivity, this technology is adding a whole new level of control for homeowners and end users, and allows for seamless integration of demand response programs for utilities. These units also have a significant impact on HERS and other home efficiency measurements.

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

R / Introductory
EMERALD II

1:20 PM–2:50 PM CONCURRENT WORKSHOPS

**Fixing Existing Homes
(Part 2)**

David Keefe—Efficiency Vermont

In 2008, Vermont adopted a goal to weatherize 80,000 homes by 2020, with average 25% savings. We are woefully behind. Currently we fix roughly 2,000 homes per year, with average savings of less than 25%. In this session, the presenter will outline how this work is done, what opportunities exist for doing more of it, and how we can do it better. We'll start with some lessons about indoor air quality, carbon monoxide, ventilation, and moisture learned over the 30 or so years that the weatherization industry has existed. We will discuss the state of the diagnostics art, the tools and techniques we use to figure out what to do. Then we will move to the hands-on work itself, practical things we are doing in Vermont homes to make them work better. We will wrap up with some challenges that the industry faces, including staffing and sales. This session is appropriate for those already doing this work, those considering getting into it, and anyone who wants to better understand how it is done.

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

R / Intermediate
EMERALD III

**A Case Study on an Urban-Infill
Net-Positive, Foam-Free Passive
House Project**

Arthur Chukhman—Duncan Wisniewski Architecture
Jacob Deva Racusin—New Frameworks
Chris West—Eco Houses of Vermont

This presentation will feature a case study of Burlington's first certified Passive House project, which is modeled to be net-positive in operation energy. This addition to an existing duplex is built with foam-free construction with a focus on low-carbon materials. The team will share their design process, which includes an embodied carbon analysis to compare different insulation strategies, as well as a cost analysis to select the wall system.

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

R / Intermediate
DIAMOND II

🏠 Selling Lower-Cost High-Performance Building Envelopes C / Advanced
DIAMOND 1

Henri Fennell Jr.—HC Fennell Consulting, LLC

This session will introduce a proven marketing strategy for designing and constructing high-performance building envelopes / enclosures at a lower overall up-front construction cost. It will highlight the importance of integrated design and performance guarantees in the construction of more sustainable, energy-efficient commercial buildings that reduce energy use, fossil fuel emissions, and life-of-the-building operating costs. The presenter will provide an overview of a comprehensive cost-reduction protocol (CRP) that takes economic advantage of the energy performance realized in building envelope designs with guaranteed low air leakage rates.

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

🏠 Doing Better for Less: R-30 Walls and Beyond—High Performance, Less Cost R / Intermediate
EMERALD I

David Johnston—David Johnston & Co., Representing Maine Indoor Air Quality Council
William Turner—Representing Maine Indoor Air Quality Council

There are many ways to design and construct a high-performance wall insulation system that would meet or exceed the 2015 IECC code intent. This presentation will focus on a wall insulation system that, in the presenters' opinion, is the easiest to implement and the most cost-effective approach for cold climates, where much of the year is cold and wet, and summertime can be hot and humid. The approach has been implemented in a variety of building types.

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

🔧 Ensuring Your Energy Remains Affordable, Using Existing Data for Energy Optimization C / Intermediate
AMPHITHEATRE

Charles Van Winkle—Housing Vermont

This session is an overview of the tools developed by Housing Vermont, namely the Parsons Platform, to leverage the emerging Internet of Things so as to optimize building energy consumption. The Parsons Platform works as a complement to a traditional building management system (BMS) by aggregating available data, presenting it in a visual format, and providing the opportunity to study equipment operation. By using a relational database, the platform allows for an expeditious presentation of system functionality with a long-term perspective. Housing Vermont is using the Parsons Platform to validate its life-cycle cost decisions in equipment selection.

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



810

Green Jobs for Equipment Suppliers

3:15 PM–4:45 PM CONCURRENT WORKSHOPS

🔧 Deep and Holistic Energy Efficiency Applications C / Intermediate
AMPHITHEATRE

Thomas Durkin—Durkin and Villalta Partners Engineering

The presenter was a panelist on the April 2018 ASHRAE webcast "Making Energy Efficiency a Reality." This session will examine four case studies featured in the webcast in much greater detail, two of which won ASHRAE Technology Awards. All of them demonstrate "outside the box" thinking that resulted in better buildings with exceptional efficiency and without increased cost. The presenter will concentrate on the successful application of technology transfer and integrating multiple HVAC concepts into coherent systems.

Accreditation: AEE, AFE, AIA—pending approval, ASHRAE, BPI, CSI, LEED

🔧 Drill, Baby, Drill! Residential Geothermal: Can It Scale? R / Introductory
DIAMOND I

Ryan Dougherty—Geothermal Exchange Organization

Kathy Hannun—Dandelion Energy

Jake Marin—Efficiency Vermont

Gretchen Schimelpfenig—Burlington Electric Department

Ground source heat pump (GSHP)—or geothermal heat pump—systems are the most efficient heating and cooling systems available and an effective strategy for decarbonizing buildings. GSHPs can eliminate fossil fuel heating and domestic hot water systems, can greatly reduce CO₂ emissions and electric peak demand, and can help our state achieve the goals of its Comprehensive Energy Plan. Over the past decade, innovative new business models have emerged that hold promise to move geothermal from a boutique technology to an affordable HVAC solution for all. In Vermont, however, barriers exist in improving affordability and developing the supply chain. Can we scale geothermal in Vermont as we are seeing in other states and Canada?

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

🔧 Lessons from Large-Scale Hippie Design-Build Projects in the 1970s R / Intermediate
EMERALD II

Bill Maclay—Maclay Architects

John Rahill—Black River Design, Architects

Goddard College and the Dimetrodon Group at Prickly Mountain built some special buildings under the guidance of architect David Sellers at Goddard, and Bill Maclay, Jim Sanford, and Dick Travers at Dimetrodon. These were some of the largest design-as-you-build projects ever undertaken, and it was an exciting time. The presenters will show these projects and discuss the benefits and limitations of this development model, as well as share specific lessons learned and changes since that time in our understanding of energy efficiency.

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

🏠 Encouraging Building Airtightness: A New Five-Story Building in Maine C / Intermediate
EMERALD I

Frederick McKnight—Turner Building Science and Design, LLC

In 2019, the presenter completed a building enclosure commissioning program on a five-story building in Bangor, Maine. The building is a new structure housing offices and a computer center. The design intent was to build a very energy-efficient building. The structure was tested for airtightness. The goal was 0.25 CFM/sq. ft. at 75 Pascal pressure difference, and the tested result was 0.04 CFM/sq. ft. The design included a modern wall structure, a roof with minimal penetrations, and

a poured concrete basement (walls and floors). The enclosure assembly was composed of standard, readily available components. This session will explain how these results were accomplished.

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

† Innovations in Zero Energy Modular (ZEM) R / Intermediate
EMERALD III

Peter Schneider—Efficiency Vermont

Factory-built housing continues to expand, particularly in the high-performance and affordable housing markets. Vermont's zero energy modular (ZEM) initiative is one way the state is demonstrating how we can meet our energy and affordable housing goals in the building sector. The ZEM effort continues to evolve and innovate as it faces new challenges. This session will take an in-depth look at the ongoing effort to gain traction in the housing market. It will consider all aspects of ZEM projects and highlight successes and failures, thermal envelope and HVAC innovations, hurdles to overcome, and the outlook for the future.

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

† Demystifying Digital Marketing: What Tactics Work for Home Performance and What Should You Be Spending? R / Introductory
DIAMOND II

Peter Troast—Energy Circle

The digital advertising and lead generation landscapes have changed dramatically as they affect home performance and HVAC businesses. Google launches new products, paid search continues to grow more complex, the third-party review landscape is changing, and Facebook retains its dominance. These factors present a significant opportunity for contractors to lower marketing costs and better the bottom line. While implementing these updates and remaining vigilant about growth opportunities, business owners must ask: What are we comfortable paying for a lead, and is that lead exclusive? What is the likelihood that lead will turn into an estimate or job? We will discuss these and other questions.

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

DAY 2: THURSDAY, FEBRUARY 6

9:00 AM–10:30 AM CONCURRENT WORKSHOPS

🏠 Non-Energy Benefits—Three Exciting New Programs at Efficiency Vermont C / Intermediate
EMERALD I

Lauren Morlino—Efficiency Vermont
Ali White—Efficiency Vermont

This presentation will explore the non-energy benefits associated with three new Efficiency Vermont programs: Whole Building Controls (energy efficiency, optimized space utilization, asset management), Refrigerant Leak Detection and Remediation (energy efficiency, carbon savings, equipment reliability, product safety), and Indoor Agriculture (energy efficiency, product quality, building health). The presenters will show energy efficiency measures as one factor among many motivating customers to undertake projects.

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

✉ The Evolution of Mid-Rise Design: Increasing Opportunities with Wood C / Intermediate
AMPHITHEATRE

Ricky McLain—WoodWorks

Increasingly, wood buildings of five, six, and more stories are rising up among traditional concrete and steel shells as designers and developers embrace timber's vast potential for lower costs, faster installation, and a significantly lighter carbon footprint. Through the use of project examples, this session will illustrate trends in both residential and commercial mid-rise buildings. Topics will include current code allowances that offer opportunities for taller buildings, design strategies for improved building performance, and code-compliant options for meeting fire and life safety requirements.

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

🔧 2020 HVAC, a Showcase of Emerging Systems R / Intermediate
EMERALD III

Jake Marin—Efficiency Vermont
Matt Sargent—Efficiency Vermont

2020 HVAC is a technology overview / showcase. Today's market offers many new systems, and it can be confusing for professionals trying to stay current. The session will examine a catalog of residential HVAC system types and give recommendations and best practices for each system. This presentation will cover complete domestic hot water solutions, ventilation systems with integrated distribution, centrally ducted heat pumps, air-to-water heat pumps, mini-split heat pumps, and advanced wood heating systems. It will explore best practices for integrating new technologies with existing systems and how to use controls to optimize system performance.





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



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Green Jobs for Contractor Companies

KEY TO WORKSHOP TRACKS

-  Building Systems
Sponsored by Zehnder America
-  Commercial
-  Crossroads
-  Enclosure
Sponsored by Parksite

R = Residential C = Commercial

† Ensuring Demand for Efficiency Over Time: Energy Education in Vermont R / Introductory **DIAMOND I**

Andy Shapiro—Energy Balance
 Cara Robeck—Vermont Energy Education Program

Educating youth is critical to combating climate change and ensuring a growing market for efficiency and renewables. The Vermont Energy Education Program provides learning experiences for K-12 students throughout Vermont and New Hampshire, using the best hands-on science teaching techniques to trigger students' curiosity about energy and climate science. Students' inventiveness and passion for the environment are engaged in actually making change in their schools, their homes, and their own energy use. Participants will see the tools being brought into schools and be inspired by what the next generation is learning.

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

✉ Healthy Homes and Home Performance: Making the Homeowner Connection R / Introductory **EMERALD II**

Peter Toast—Energy Circle

One of the greatest challenges the home performance industry faces is how to connect consumer demand for healthy homes with private market opportunities for home performance improvement. The demand for and awareness of healthy homes continues to grow, but few homeowners connect health issues with the systems that make up their home. The presenter will explain the trajectory of the healthy homes movement within home performance, and unpack how contractors can bridge this communication gap with homeowners, as well as cover the foundations of a healthier home business and marketing strategy.

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

🏠 Lean Thinking Applied to All Energy Usage C / Intermediate **DIAMOND II**

Kevin Vidmar—Loureiro Engineering Associates

This presentation will discuss typical "lean" principles, and then apply these principles to energy reduction at all sorts of different sites. Attendees will learn that lean thinking does not apply only to manufacturing, but to all of life, and especially energy. Among other things, this presentation will discuss value-add versus non-value-add, and also normal and abnormal energy usage. Specific examples will be shown for industrial, commercial, hospital, and residential settings.

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

11:00 AM–12:30 PM CONCURRENT WORKSHOPS

🔧 Good Enough—Hitting the Energy Jackpot R / Introductory **DIAMOND II**

Samantha Dunn—Housing Vermont
 Gregg Gossens—gbA
 Steve Poole—VHV

Wentworth Community Housing is a 30-unit new construction mixed-income housing project developed by Twin Pines Housing and Housing Vermont, designed by gbA, and constructed by ReArch Company. The team's goal from the beginning was to create a building with a high-performance shell; an aggressive air-sealing target; and a simple, low-life-cycle-cost HVAC system resulting in a sustainable, low-maintenance building with a viable operating budget. The presenters will share how they achieved this goal, including 0.0375 CFM50/sq. ft. on its final blower door test, with teamwork, careful attention to design details, in-progress air-sealing testing, and creative electrical, HVAC, and controls design work.

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

🔧 Fossil Fuel Free at Last: Air-to-Water Heat Pump and Ventilation Retrofit R / Intermediate **EMERALD I**

Brian Just—Efficiency Vermont

This presentation takes a hands-on approach to two hot topics: air-to-water heat pumps and fresh air (balanced) ventilation. A photo-rich overview of a retrofit project will be provided, along with full costing info so that the audience can understand impacts from all angles. Data provided will help people understand system performance from both energy and non-energy perspectives. Given the heavily boiler-based New England market, participants will walk away with a new understanding of the potential of this new class of efficient heating equipment, plus the opportunities and co-benefits of other HVAC equipment installed alongside it.

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

† Solar Roofing—A Better Way to Go Solar R / Intermediate **AMPHITHEATRE**

Oliver Koehler—SunTegra

Solar roofing is an exciting new way to go solar. The presenting company, based in Highland, New York, is a leader in this space. The presentation will provide building professionals an overview of how solar roofing products compare to conventional solar panels, considering their benefits and challenges and their current and future economics. The presenter will also spend time showing some samples and answering participants' questions.





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

† Grid-Connected Homes and Businesses R&C / Introductory **DIAMOND I**

James Gibbons—Burlington Electric Department
 Julia Leopold—Vermont Public Power Supply Authority
 Lisa Morris—Vermont Electric Cooperative
 Bill Powell—Washington Electric Cooperative
 Graham Turk—Green Mountain Power Corporation

Vermont's distribution utilities are on the leading edge in promoting strategic electrification, renewable energy, and load management through controls and behavioral modifications. These efforts help them manage system load, increase the use of available clean energy, and reduce energy costs. In this

KEY TO WORKSHOP TRACKS

-  Building Systems
Sponsored by Zehnder America
-  Commercial
-  Crossroads
-  Enclosure
Sponsored by Parksit

R = Residential C = Commercial

session, several of Vermont's electric utilities will share their efforts to promote and implement grid-connected devices in homes and businesses to leverage renewable energy and lower demand costs through flexible load management.

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

✉ **Water, Vapor, Air: How Physics Can Help You Choose the Right Membrane** R / Intermediate EMERALD III

John Straube—RDH Building Science

Vapor barriers continue to be a source of confusion to many. When is an air barrier also a vapor barrier? When should it be one? New requirements, assemblies, and materials have added new questions. Do smart barriers work? When should they be used? The presenter will walk attendees through the science of condensation and air control to illuminate which materials work in different situations—and why.

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

✉ **How to Draw Down Carbon Now with Our Buildings: Practical Solutions and Design Strategies (Part 1)** R / Intermediate EMERALD II

Chris Magwood—Endeavour Centre
Ace McArleton—New Frameworks
Jacob Deva Racusin—New Frameworks

A practical companion to the keynote speech, this session delves into hands-on, technical solutions for storing carbon in buildings. The presenters will demonstrate carbon-storing materials and their use in buildings; share design strategies to yield carbon-storing buildings; introduce tools to evaluate embodied carbon in design projects; and explore resources and action steps. The time frame for us to reverse the trajectory on climate change is extremely short: less than 10 years. Help build the industry movement to become climate heroes and leaders in carbon drawdown!

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

1:45 PM–3:15 PM CONCURRENT WORKSHOPS

✉ **Energy Efficiency Upgrades for Addison Northwest School District Save Taxpayers Money** C / Intermediate DIAMOND I

Mike Davey—Energy Efficiency Investments

Addison Northwest School District is made up of three elementary schools feeding into a unified middle and high school. The buildings varied in terms of comfort, efficiency, and safety. This project addressed a number of deficiencies in lighting, ventilation, and heat in all four buildings, with a focus on Vergennes Elementary School and the high school. Combined with a new solar array at the high school, the project efforts have resulted in substantial savings. The high school fuel usage declined 15% per degree day, and electric use dropped 43%. This session will detail the actions taken.

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

✉ **Zero Energy Now—Vermont's Existing Homes Solution** R / Intermediate EMERALD I

Richard Faesy—Energy Futures Group
Russ Flanigan—Building Energy
Tom Perry—New Leaf Design, LLC
Li Ling Young—Efficiency Vermont

The Building Performance Professionals Association of The

Building Performance Professionals Association of Vermont launched the Zero Energy Now pilot program several years ago. The concept applied a coordinated strategy of weatherization, heat pumps, biofuels, and solar PV—and delivered more than 60% fossil fuel and electric grid savings across 24 projects in existing Vermont homes. The presenters take lessons learned and share actual savings results, along with a discussion of the future of a Zero Energy Now program in Vermont. Participants—contractors, especially—are invited to learn more about a program in which they can participate that has the potential to deliver exceptional results and move Vermont substantially toward its 2050 climate goals.

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

✉ **The Ghosts Among Us—Reducing Air Infiltration from the Darkest Recesses to Dramatically Improve Comfort and Energy Performance** R / Introductory DIAMOND II

Karen Bushey—Efficiency Vermont
Mary Jane Poynter—Efficiency Vermont
Allison Ross—Efficiency Vermont

Building airtightness is a 30-year-old concept, but buildings have not always maximized the long-term benefits of focusing attention on air-sealing details. Airtightness in multifamily and commercial buildings in Vermont has improved over the last 15 years. Both energy modeling and actual energy usage has shown that lower air leakage rates can have a bigger impact on building energy usage and system sizing than adding more insulation to the building walls and roof. This presentation will include blower door test data and demonstrate how buildings have achieved increasingly tighter envelopes. The presenters will use energy modeling data to illustrate air-sealing and insulation impacts on energy use and discuss the top five strategies to ensure tight building envelopes.

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

✉ **Solar Plus—Electrifying Our Lives Provides a Better ROI** R / Intermediate AMPHITHEATRE

Kimberley Quirk—ReVision Energy

Energy efficiency and renewable energy projects are often evaluated for their return on investment, whether it is to justify the financing method or to understand the savings over time. This presentation will look at the return on investment of various projects, including solar PV systems, air source heat pumps, water heaters, and electric vehicle chargers. It will also discuss combinations of systems powered with solar PV to see how much better the return on investment can be as we move to electrify more and more of our energy uses.

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

✉ **Fuzzy Solutions: Safe, High-Performance Enclosures with No Foam** R / Intermediate EMERALD III

John Straube—RDH Building Science

Foam plastics have a lot of nice characteristics for enclosure design, but they're not right for every project. Increasingly, designers or owners are asking for options for unvented roofs, interior retrofits, and low-slope roofs that use only fibrous (mineral and organic) insulation. This session will investigate the different concerns to address when using fibrous insulation, and discuss techniques to allow for the same airtightness, condensation resistance, and diffusion control. Case studies and monitoring results from actual projects will be presented.

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

✉ **How to Draw Down Carbon Now with Our Buildings: Practical Solutions and Design Strategies (Part 2)** R / Intermediate EMERALD II

Chris Magwood—Endeavour Centre
Ace McArleton—New Frameworks
Jacob Deva Racusin—New Frameworks

A practical companion to the keynote speech, this session delves into hands-on, technical solutions for storing carbon in buildings. The presenters will demonstrate carbon-storing materials and their use in buildings; share design strategies to yield carbon-storing buildings; introduce tools to evaluate embodied carbon in design projects; and explore resources and action steps. The time frame for us to reverse the trajectory on climate change is extremely short: less than 10 years. Help build the industry movement to become climate heroes and leaders in carbon drawdown!

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

3:30 PM–5:00 PM CONCURRENT WORKSHOPS

🏠 **Better Buildings through Better Chemistry** C / Intermediate EMERALD I

Lisa Carey Moore—Integrated Eco Strategy
Charley Stevenson—Integrated Eco Strategy

How does a project succeed in creating a healthier building? First, it is not an all-or-nothing endeavor, rather a spectrum of effort with many entry points. Second, it is easier to get started than one might think. In this session, the presenters will cover easy steps and modest goals all the way through to ambitious efforts by delving deeply into not just products, but also process. Using examples and experience from a wide range of project types, the presenters will discuss opportunities, costs, hurdles, and solutions.

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

🏠 **Flexible Load Management: Results from the Green Mountain Power FLM Pilot** C / Intermediate DIAMOND II

Morgan Casella—Dynamic Organics, LLC
Marcus Jones—Efficiency Vermont
Jeff Monder—Green Mountain Power

Flexible load management is one of Efficiency Vermont's evolved services that is being explored in the Demand Resources Plan. This session will review the results from the Green Mountain Power Flexible Load Management pilot. The presenters will share lessons learned as well as highlight examples from various customers. Attendees will come away with a clearer understanding of flexible load management and why it is so important.

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

✂️ **Want to Save Energy? It's about the Outside Air!** C / Intermediate AMPHITHEATRE

Barry Stephens—Ventacity Systems Inc.

This session will present a very effective model that has been established across North America to retrofit existing HVAC systems on small to medium-sized commercial buildings in order to achieve very significant energy savings, improved indoor air quality (IAQ), and comfort. The presentation will provide multiple case studies with data detailing where the savings are realized, and how IAQ and comfort are also enhanced. And the presentation will outline the steps to

implementing and installing these retrofits to meet both energy efficiency goals and a reasonable financial ROI.

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

✉ **Net-Zero Lessons Learned: Design, Construction, and Two Years of Living in a High-Performance Home** R / Intermediate EMERALD III

Jean Terwilliger—Vermont Integrated Architecture

When we have the privilege to design for ourselves, how do we narrow the infinite options into a coherent project while balancing cost and performance? This presentation will walk through the steps of finding an appropriate site, developing a program and budget, and working through schematic design; then dig into the details of choosing materials, pushing the envelope on the mechanical systems, keeping the budget in check, and deciding whether to certify and through which system; and finally discuss what it is like to live in a high-performance net-zero home for two years, and the lessons learned to carry into future projects.

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

🏠 **The Environmental Impact of Refrigerants: Past, Present, and Future** C / Introductory EMERALD II

Ethan Bellavance—Efficiency Vermont
Jake Marin—Efficiency Vermont
Ali White—Efficiency Vermont

This presentation will bridge the gap between commercial and residential stakeholders and will introduce a more commercial topic (refrigeration) in a high-level format that should be of interest to anyone affected by impending legislation, as well as anyone who is passionate about the environment. Refrigerant management is the primary way a global society can mitigate climate change. This presentation will educate attendees and empower them to make a difference.

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

✂️ **Pellet Stoves—The Renewable, Affordable, Hygge Heating Solution That's Available Now** R / Introductory DIAMOND I

Emma Hanson—Vermont Department of Forests, Parks and Recreation

For thousands of homeowners, making the switch to renewables is both daunting and financially untenable. Solution? The pellet stove. For just \$3,000 to \$4,000, a homeowner can install an auxiliary heat source that is pleasant to look at, clean burning, easy to run, and renewable—easily offsetting 70–99% of fossil heating fuel use while still retaining the fossil system as backup. Attendees will leave this session as pellet stove advocates! Learn about their applications, available rebates and financing, pros and cons as compared to woodstoves and heat pumps, and how wood heat helps Vermont's forests remain forests.

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



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Green Jobs for Retailers

EEN Sessions

DAY 1: FEBRUARY 5, 2020

Bosch Inverted Ducted Split System Heat Pumps

Providence Boardroom

10:30–11:30 AM

This session is presented by TSS Associates on behalf of Bosch, manufacturer of highly efficient heating and cooling solutions for residential and commercial retrofit and new construction applications. This session will cover inverted technology heat pumps and how they apply to ducted systems; how to match furnaces, air handlers, and cased evaporator coils to AHRI (NEEP) certified equipment; and the benefits of matching Bosch heat pumps with other equipment—no communication required.

Drain Water Heat Recovery Technology and Application Review with Case Studies

Providence Boardroom

1:30–2:30 PM

This session is presented by RenewABILITY Energy, a leader in no-maintenance and low-maintenance drain water heat recovery (DWHR) technologies throughout North America. With over 100,000 units in use, proven DWHR technologies have been designed into residential and commercial buildings in many countries and are now even mandatory in some jurisdictions. A clear explanation of how falling-film DWHR systems work will be provided. Different DWHR installation methods will be reviewed. Case studies will include single-family residential, multifamily residential, and commercial buildings, including hotels, hospitals, and restaurants. Potential energy credits and compliance with energy codes will also be reviewed.

Innovations in Water Heating

Providence Boardroom

3:30–4:30 PM

This session is presented by Rheem Water Heating, a pioneer in developing innovative advancements in heating, cooling, and water heating. The Rheem Hybrid Electric Water Heater pays for itself with up to an estimated \$4,750 in energy cost savings over 10 years. This water heater offers protective alerts and service notifications sent straight to customers' phone for peace of mind. This session will cover features and benefits, proper installation techniques, sizing, how to set up Wi-Fi for alerts and notifications, and basic troubleshooting. It will also cover how to combat common myths about hybrid heat pump water heating.

EEN Sessions

DAY 2: FEBRUARY 6, 2020

Best Practices for ZIP System and ZIP System R Sheathing Installation

252 Tavern

11:00 AM–NOON

This session is presented by Huber Engineered Woods, the manufacturer of ZIP System and AdvanTech brands, and will focus on the appropriate amount of continuous insulation to use in climate zones 5 and 6, best practices for installation of ZIP System and ZIP R sheathing, and detailing windows and wall penetrations with ZIP System, as well as application tools and tips for use with ZIP System accessories.

Refrigeration Refresher and Heatcraft Controls

Providence Boardroom

2:00–3:00 PM

This session is presented by Heatcraft RPD, manufacturer of climate-control solutions for commercial refrigeration and industrial cooling applications. Heatcraft's intelliGen control system, as well as its variable speed condensing units with the Orbus Controller, are leading the way in making a difference in overall energy use today. This session will go over basic technology on the refrigeration cycle and a selection of Heatcraft's most efficient products.



Keynotes



Chris Magwood is the executive director of the Endeavour Centre, a not-for-profit sustainable building school in Ontario. In 1998 he co-founded Camel's Back Construction, and as a contractor, designed and built more than 30 homes and commercial buildings, mostly with straw bales and often with renewable energy systems. Chris has authored seven books on sustainable building, and is currently working on an M.A. at Trent University, studying the carbon storage potential of the built environment.

chris@endeavourcentre.org



Ace McArleton founded New Frameworks Natural Design/Build in 2006 to offer green remodeling and new construction services blending natural building materials and methods with high-performance design. Ace instructs 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 for building healthy, just communities.

ace@newframeworks.com



Jacob Deva Racusin is co-owner of New Frameworks, offering design, construction, consultation, and education services featuring low-impact high-performance building technologies. He is also program director of the certificate program in building science and net zero design at the Yestermorrow Design/Build School, and is a BPI-certified contractor. Jacob is the author of the books *Essential Building Science* and *The Natural Building Companion*.

jacob@newframeworks.com

Presenters

Ethan Bellavance

Ethan Bellavance is a senior energy consultant in VEIC's Energy Services Division, specializing in refrigeration project management for customers in and out of Vermont. He works directly with businesses to identify optimal energy efficiency solutions for their business models and strategies, conducting technical and financial analyses that support these solutions. A seasoned refrigeration retrocommissioning project manager for larger commercial and industrial facilities, Ethan has managed refrigeration energy efficiency, leak remediation, and pressure control projects at well over 100 sites.

Efficiency Vermont • ebellavance@veic.org

Karen Bushey

Karen Bushey, AIA, LEED AP, CPHC, PHIUS+ Rater, is a VEIC energy consultant with over 20 years of experience in the field of high-performance building design and construction. At VEIC, Karen has helped project teams create comfortable, durable, low-energy buildings that optimize their performance with cost-effective solutions. Karen's knowledge and experience in high-performance building has been key to the success of many residential, multifamily, and commercial projects in New England, including several award-winning Passive House buildings.

Efficiency Vermont • ksbushey@veic.org

Diane Cabral

Diane Cabral is Rheem's Northeast and mid-Atlantic region manager with the Utilities Division; she focuses on promoting highly efficient products and bridging the gap between consumers, distributors, and utility incentives and programs. Rheem is currently forging partnerships for better grid management and promoting solutions for green homes and optimal HERS scores.

Rheem Water Heaters • diane.cabral@rheem.com

Lisa Carey Moore

Lisa Carey Moore is involved in all phases of projects to provide support to teams looking for materials that avoid ingredients of concern. She works closely with design teams who want specific products, and with contractors looking to address "Red List" issues. She's been involved in materials research and project support for three Living Certified projects: Williams College's Class of '66 Center, the R.W. Kern Center, and the Hitchcock Center for the Environment.

Integrated Eco Strategy • lisa@integratedecostrategy.com

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. Morgan has an extensive background in renewable energy and efficiency projects, with a focus on distribution, transmission, and efficiency utility regulatory requirements.

Dynamic Organics, LLC • mcasella@dynorganics.com

Arthur Chukhman

Arthur Chukhman is an architect and certified Passive House designer at Duncan Wisniewski Architecture, a firm that has done many high-performance multifamily projects in Vermont. In his role as the office sustainability coordinator, he has worked to optimize envelope details and push the use of low-carbon materials. Arthur is a board member of the Burlington 2030 District and is the coordinator of the Northern Vermont Building Science Group.

Duncan Wisniewski Architecture • arthurc@duncanwisniewski.com

Mike Davey

Mike Davey is the business development manager for Energy Efficient Investments (EEI), a performance contractor that focus on energy-efficient and renewable solutions. The EEI team has recently completed comprehensive performance contracts for Bennington School District, BROCC, and the ANWSD. 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 University of Massachusetts Lowell.

Energy Efficiency Investments • mdavey@eeiservices.com

Ryan Dougherty

Ryan Dougherty has served as GEO's chief operating officer since 2014. He has extensive experience in public policy and governance and most recently served as deputy director of the Illinois Healthcare and Human Services Framework, a multi-agency state technology initiative. Prior to that position, he served as senior policy advisor at the Illinois Department of Commerce and Economic Opportunity. He has worked in a number of other positions within state government.

Geothermal Exchange Organization • ryan@geoexchange.org

Samantha Dunn

Samantha Dunn is a developer at Housing Vermont with a particular interest in high-performance, sustainable design. Samantha created an energy model spreadsheet to help guide the innovative design / build HVAC process for the Wentworth Community Housing project. Her efforts resulted in a first-of-its-kind HVAC system for Housing Vermont.

Housing Vermont • SDunn@hvt.org

Thomas Durkin

Thomas Durkin is senior partner of Durkin and Villalta Partners Engineering. Recognized for innovation and creativity, he is a nationally sought-after speaker and promoter of energy-smart systems. He has either invented or pioneered the implementation of nine distinct HVAC innovations, all of which save energy and reduce pollution. Tom has written many articles for the ASHRAE Journal and other industry magazines, and is a co-author of the *HVAC Pump Handbook*, the definitive text on all things hydronic.

Durkin and Villalta Partners Engineering • thdurkin46@gmail.com

Richard Faesy

Richard Faesy is a principal and co-founder of Energy Futures Group (EFG) in Hinesburg, Vermont. He has more than 30 years of experience in the clean energy industry working with hundreds of clients and programs throughout the U.S. and Canada. Prior to founding EFG, Richard worked at the VEIC for 21 years.

Energy Futures Group • rfaesy@energyfuturesgroup.com

Henri Fennell Jr.

Henri Fennell is a building envelope specialist and architect with 45 years of experience in energy conservation design, manufactured products, and services. His work with polyurethane foam began during the energy crisis of the 1970s. His experience has included being a practicing architect, a building envelope consultant, and a remediation and commissioning consultant. Major historic projects include the Guggenheim Museum. He has designed several micro-load buildings, including a net-zero energy research structure in Antarctica.

HC Fennell Consulting, LLC • hfennell09@gmail.com

Russ Flanigan

Russ Flanigan is a senior energy analyst and solar project manager at Building Energy Vermont. He cut his teeth in the building trades and energy efficiency in Vermont and Southern California. Since 2008, Russ has focused on the whole house approach to residential energy efficiency, with a passion for net-zero and near-zero homes. He is a Vermont Building Professionals Association board member and runs day-to-day operations of a thriving solar and heat pump division.

Building Energy • rflanigan@buildingenergyus.com

Curt M. Freedman

Curt Freedman, president of CMF Engineering, Inc., is a registered professional engineer in 12 states, a consultant, and a senior member of the National Academy of Forensic Engineers. He is also an adjunct professor at Western New England University (in Springfield, Massachusetts) and a published author in solar energy.

CMF Engineering, Inc. • cmf.freedman@gmail.com

James Gibbons

James Gibbons heads the Policy and Planning team at Burlington Electric Department, responsible for wholesale power market interactions, energy contracting, renewability, strategic electrification program design, and long-term planning. Prior to joining BED, James worked for almost 20 years at the Vermont Public Power Supply Authority, where he worked in load forecasting and rate design, and later managed the organization's power supply and transmission activities. James was a key participant in securing BED's 100% renewable energy portfolio.

Burlington Electric Department • jgibbons@burlingtonelectric.com

Gregg Gossens

Gregg Gossens is one of the founding partners of gbA. He is a committed believer in a collaborative creative process and the ability of design to transform and enhance communities. Gregg is also an adjunct professor at the Norwich University School of Architecture and Art.

gbA • ggossens@gbarchitecture.com

Kathy Hannun

Kathy Hannun is the co-founder and CEO of Dandelion Energy, the nation's leading home geothermal company. Prior to Dandelion, Kathy worked as a rapid evaluator at Alphabet's X lab. Kathy has been recognized as one of *Fast Company's* Most Creative People in Business, *MIT Tech Review's* 35 under 35, *Albany Business Review's* 40 under 40, and as a "leader of tomorrow." Kathy graduated from Stanford with a B.S. in civil engineering and an M.S. in computer science.

Dandelion Energy • kathy.hannun@gmail.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 in 2017. She holds an M.S. in agriculture, food and environmental policy from Tufts University.

Vermont Department of Forests, Parks and Recreation
emma.hanson@vermont.gov

David Johnston

David Johnston is president of David Johnston & Co. in Gorham, Maine. After 40 years of designing and building high-performance homes, he is concentrating on teaching and consulting. As an adjunct instructor at Central Maine Community College (CMCC), he teaches building science and plan reading & construction cost estimating. He holds a bachelor of science degree in industrial education. David serves on advisory committees for the building construction programs at CMCC and at Westbrook Regional Vocational Center.

David Johnston & Co., Representing Maine Indoor Air Quality Council • djohn2054@gmail.com

Marcus Jones

Marcus Jones is an energy consultant in VEIC's engineering group, specializing in HVAC and control system strategies. With more than 20 years of experience in the building construction, maintenance, and energy efficiency industries, he is a technical expert in commercial and industrial markets. Marcus is the technical lead for predictive control strategies and flexible load management practices for efficient buildings as a means of supporting grid stability.

Efficiency Vermont • mjones@veic.org

Brian Just

Brian Just manages Efficiency Vermont's team of Residential New Construction energy consultants and works on a variety of energy efficiency initiatives at VEIC. He is Passive House and LEED AP accredited, and currently serves as president of the Vermont Green Building Network. Brian is committed to serving the residential design and construction community as its members pave the way to a future of highly efficient—but also healthy, durable, and comfortable—homes.

Efficiency Vermont • bjust@veic.org

David Keefe

David Keefe of VEIC / Efficiency Vermont is a former contractor and a well-known teacher with 34 years of experience in making homes work better. He has delivered over 1,000 sessions and is known as a personable and friendly teacher who loves to answer questions. In 2011, he was honored by ACI Inc. as one of "the 25 most instrumental people in building the home performance industry," and in 2017 he was awarded the Linda Wigington Leadership Award by the Home Performance Coalition.

Efficiency Vermont • dkeefe@veic.org

Oliver Koehler

Oliver Koehler has worked in the solar industry for over 15 years. His experience includes working with leading PV manufacturers such as SunPower and BP Solar and with startups such as BIPV Inc. and Integrated Solar Technology, where he is currently CEO and founder. His expertise involves the development, manufacture, and marketing of solar products.

SunTegra • oliver.koehler@suntegrasolar.com

Julia Leopold

Julia Leopold joined VPPSA in 2019 as the communications specialist. Julia handles media requests, public relations, marketing outreach, and internal communications. She holds a bachelor of science degree in atmospheric science from Cornell University and has nearly a decade of experience as an on-air broadcast meteorologist.

Vermont Public Power Supply Authority • jleopold@vpps.com

Bill Maclay

Bill Maclay, the founder and president of Maclay Architects, has lectured or taught at many colleges and universities. He has a B.A. from Williams College and a master of architecture degree from the University of Pennsylvania. He is a past president of the Vermont chapter of the American Institute of Architects (AIA). Bill has continuously been involved in research on all aspects of environmental design including sustainable design, indoor air quality, building science, and material selection.

Maclay Architects • wmap@maclayarchitects.com

Jake Marin

Jake Marin is the HVAC and refrigeration program manager for Efficiency Vermont. In his tenure, he has refocused resources on renewable thermal technologies such as heat pumps and advanced wood heating. He works closely with the supply chain to ensure that the most efficient products are available and that installers have the training they need to sell and install efficient equipment. He has also helped increase Efficiency Vermont's involvement with commercial refrigeration.

Efficiency Vermont • jmarin@veic.org

Frederick McKnight

Frederick McKnight has specialized in the energy-efficient design of HVAC systems. His commitment to energy efficiency and superior indoor air quality has led to a focus on building enclosures and the migration of air and moisture through them. Fred has commissioning experience with high-performance buildings, conventional buildings, and specialized building enclosures. He is currently the commissioning agent for a number of large buildings on campuses throughout New England.

Turner Building Science and Design, LLC
fmcknight@turnerbuildingscience.com

Ricky McLain

Ricky McLain is WoodWorks' in-house expert on tall wood buildings, providing analysis and guidance on architectural, fire and life safety, and structural design topics related to tall mass timber projects. He supports the architecture, engineering, and construction community both directly and collaboratively and guides the development of education and resources related to tall wood buildings. Ricky is executive director of the Structural Engineers Association of Vermont, and a member of numerous committees and councils related to building design.

WoodWorks • ricky.mclain@woodworks.org

Jeff Monder

Jeff Monder has over 26 years of experience in the utility industry, mostly dedicated to information technologies and leadership. Jeff has been a leader in innovation development, introducing new programs to help residential, commercial, and industrial customers increase efficiency and productivity, reduce their carbon footprint, and save money. Jeff 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 • jeff.monder@greenmountainpower.com

Lauren Morlino

Lauren Morlino researches and prototypes exciting, innovative, and efficient technologies and services for Vermont ratepayers. At Efficiency Vermont, Lauren has researched and designed initiatives for lighting, controls, and consumer electronics. She is an external advisor on lighting program design, and her work has been published on lighting and non-lighting topics. Lauren has presented at national conferences including ACEEE, DesignLights Consortium, and Esource. Lauren holds a bachelor's degree in political science from the University of Vermont.

Efficiency Vermont • lmorlino@veic.org

Lisa Morris

Coming from an urban planning background, Lisa Morris was excited to discover how dynamic and interesting the energy sector is after joining Vermont Electric Cooperative seven years ago. She works on VEC's Energy Transformation Program, Co-op Community Solar, net metering, flexible load, and other special programs. She loves seeing the cooperative model in action, interacting with VEC members, and getting to be part of shaping Vermont's energy future.

Vermont Electric Cooperative • lmorris@vermontelectric.coop

Megan Nedzinski

Megan Nedzinski is an architect, LEED AP, and certified Passive House consultant with Vermont Integrated Architecture. Megan considers emerging research, applied technology, and the surrounding environment to deliver high-performing projects. The focus of her work both professionally and academically is to analyze and communicate the relative benefits of various design strategies. Megan was a member of the wood science faculty at West Virginia University, and continues to teach through various community outreach events and at Yestermorrow Design/Build School.

Vermont Integrated Architecture, PC
megan@vermontintegratedarchitecture.com

Ashar Nelson

Ashar Nelson is a lifelong Vermonter with nearly three decades of experience in design and construction. As a principal architect at Vermont Integrated Architecture and faculty in the architectural studies program at Middlebury College, he is committed to promoting sustainable building designs and innovative construction methods. Ashar believes that an integrated design process, representing building users, constructors, estimators, and craftspeople, as well as design professionals, is essential in achieving high-performance buildings.

Vermont Integrated Architecture
ashar@vermontintegratedarchitecture.com

Tom Perry

Tom Perry has been a residential building contractor for over 30 years, and a BPI certified weatherization contractor for the last 12 years. He is now devoting as much time as possible to developing and promoting the Zero Energy Now concept in Vermont. His company, New Leaf Design, is a research and development company dedicated to designing economically viable strategies to assist businesses and industries in adapting and transforming to a near-term carbon-minimal economy.

New Leaf Design, LLC • newleafdesign@gmavt.net

Steve Poole

Steve Poole has been with VHV for over 15 years. His strength lies in his ability to quickly spot creative ways to save energy on new and retrofit projects. He has a broad range of experience in the commercial and industrial sectors with expertise in refrigeration, HVAC plumbing, process piping, and specialty gas systems.

VHV • spoole@vhv.com

Bill Powell

In 1991, Bill Powell began his co-op career as WEC's first director of energy management services. He operated a small construction company in a prior life, as well as held a volunteer role as the executive director of the (then) Solar Association of Vermont, and his role at WEC has evolved.

Washington Electric Cooperative • bill.powell@wec.coop

Mary Jane Poynter

Mary Jane Poynter is a senior energy consultant at the VEIC. She specializes in commercial, government, industrial, and multifamily building energy projects, working primarily with Efficiency Vermont and DC Sustainability Energy Utilities. 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.

Efficiency Vermont • mpoynter@veic.org

Kimberley Quirk

Kim Quirk is the Upper Valley branch manager for ReVision Energy, which merged with her business, Energy Emporium, in early 2019. ReVision provides design, installation, and maintenance services for solar systems, heat pumps, battery systems, and EV chargers. Kim completed the renovation of her 1850s building to a net-zero energy building, which met her goals of no fossil fuels, no combustion, LEED-H best practices, and preserving the embodied energy of the building.

ReVision Energy • kim@revisionenergy.com

John Rahill

John Rahill is founder of Black River Design, Architects (BRD) of Montpelier, Vermont. BRD was started in 1978 and has grown to an office of 18 people. John's career has been committed to sustainable and high-performance design with an emphasis on durability, aesthetics, and occupant comfort. John is a graduate 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 • johnr@blackriverdesign.com

Cara Robeck

Cara Robeck is the executive director of the Vermont Energy Education Program (VEEP) and its New Hampshire Energy Education Project (NHEEP). Previously, she taught at several colleges in Vermont. Cara worked at the Center for Whole Communities in Waitsfield, Vermont, as well as serving as an elected parks commissioner for the City of Montpelier, and as a member of the Montpelier Energy Advisory Committee. She has a B.A. in environmental studies, and an M.S. in renewable natural resources and development.

Vermont Energy Education Program • cara.robek@veep.org

Allison Ross

Allison Ross, CEM, is an energy consultant with VEIC. She focuses on multifamily, commercial, and military energy efficiency work. Her technical focus is on building thermal shells, and her research interest is energy resiliency and microgrids, particularly within a military context. An Army veteran, she holds a B.S. in environmental science from the United States Military Academy at West Point and an M.S. in environmental science from the University of Illinois.

Efficiency Vermont • aross@veic.org

Matt Sargent

Matt Sargent is a senior energy consultant at Efficiency Vermont, where he helps Vermonters build energy-efficient buildings. With over 30 years of experience as a builder and energy consultant, Matt has a passion for integrating advanced building envelopes with the right systems to ensure efficiency, comfort, health, and longevity. Recent work at Efficiency Vermont has allowed him to dive deep into residential HVAC systems.

Efficiency Vermont • msargent@veic.org

Gretchen Schimelpfenig

Gretchen Schimelpfenig is an energy services engineer at the Burlington Electric Department, the energy efficiency utility serving Burlington, Vermont. She previously worked as a commissioning engineer and developed field expertise with geothermal heat pump systems. In 2014, the U.S. Green Building Council published her research paper "Opportunities for Utilizing Geothermal Resources in the United States." Gretchen is a licensed civil professional engineer and holds a master's degree from Stanford in civil engineering with a specialty in sustainable design and construction.

Burlington Electric Department
gschimelpfenig@burlingtonelectric.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, and Passive House programs. Peter's objective is to help clients design and construct more energy-efficient, healthful, durable, and sustainable buildings. He runs Vermont's zero energy modular (ZEM) program and offers technical support to VEIC-led ZEM projects nationwide.

Efficiency Vermont • pschneider@veic.org



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Andy Shapiro

Andy Shapiro has provided high-performance building energy analysis, design, and monitoring consulting services for over 30 years. He provides guidance and technical expertise along the path of conceptualization, design, construction, commissioning, and post-occupancy assessment, for optimizing environmental impact, indoor environmental quality, operating and maintenance costs, and building durability. He is also the director of science and engineering for the Vermont Energy Education Program, teaching energy literacy to the next generation.

Energy Balance • andy@energybalance.us

Amy Sheldon

Amy Sheldon is a natural resource planner at Landslide, Inc., with over 30 years of experience working on conservation, restoration, and planning projects in Vermont. Elected to the Vermont House as one of Middlebury's two representatives in 2015, she is currently the chair of the Natural Resources, Fish, and Wildlife Committee and an active member of the Climate Caucus.

Landslide, Inc. • landslideamy@comcast.net

Henry Stehmeyer

Henry "Rick" Stehmeyer is a senior engineer at Cx Associates in Burlington, Vermont. Rick is an expert in HVAC controls and the former head of software department for a major controls contracting firm in New England. He has almost two decades of experience as a systems integrator, commissioning agent, and installer of major name-brand building automation systems across a wide range of markets including New York City, New Jersey, and Vermont.

Cx Associates • rick@cx-assoc.com

Barry Stephens

Barry Stephens is the Northeast region sales manager for Ventacity Systems Inc. He joined Ventacity, a startup manufacturer of very high performance, Passive House certified heat recovery ventilation and energy recovery ventilation systems, as well as advanced control systems, in 2016. Prior to that, he spent 15 years at Zehnder America, Inc. He led the introduction of Zehnder systems in North America, and has been involved with high-performance projects across North America since 2008.

Ventacity Systems Inc. • barry@ventacity.com

Charley Stevenson

Charley Stevenson has been delving deep into healthier building materials since beginning work on his first Living Building Challenge project in 2011. With the team at Integrated Eco Strategy, he has developed process and software to integrate better materials selections into all project types and to transform the market. The Red2Green platform has reduced Red List research and documentation effort by a factor of three while building up a library of over 10,000 products.

Integrated Eco Strategy • charley@integratedecostrategy.com

John Straube

John Straube, Ph.D., P.E., is a principal at RDH Building Science, where he heads forensic investigations and leads research projects in the areas of low-energy building design, building enclosure performance, hygrothermal analysis, and field monitoring of wall assemblies. He is also a faculty member in architecture and engineering at the University of Waterloo. He has been recognized with multiple awards, including the Lifetime Achievement Award in Building Science Education from the National Consortium of Housing Research Centers.

RDH Building Science • jfstraube@rdh.com

Jean Terwilliger

Jean Terwilliger, AIA, NCARB, CPHC, is a project architect with Vermont Integrated Architecture (VIA) specializing in residential design. She enjoys digging into the details of building envelope, windows, and mechanical systems, and believes that everyone should be able to enjoy the benefits of living in a low-carbon home designed for delight, comfort, and durability. She is currently working on a 24-unit affordable housing project and several high-performance custom homes. She designed her own almost-Passive House.

Vermont Integrated Architecture
jean@vermontintegratedarchitecture.com

Peter Troast

Peter Troast is the founder and CEO of Energy Circle, a team of digital marketing experts and strategists who work with over 350 HVAC, solar, insulation, and home performance companies. He is a passionate advocate for the power of the whole house home performance business model, and is a popular and high-ranking speaker about marketing for contractors. In 2015, he received the Tony Woods Award for excellence in advancing the home performance industry.

Energy Circle • ptroast@energycircle.com

Graham Turk

Graham Turk is a member of the Innovation Development team at Green Mountain Power (GMP). His work involves designing and executing innovative pilot projects that contribute to GMP's larger mission to transform our energy system into one that is more distributed, carbon-free, and community-centered, while reducing costs and increasing reliability for customers. Prior to GMP, Graham completed a Fulbright grant in Sweden on peer-to-peer solar energy markets. He holds a bachelor's degree from Princeton University in computer science.

Green Mountain Power Corporation
graham.turk@greenmountainpower.com

William Turner

William Turner is the president emeritus of Turner Building Science and Design in Harrison, Maine. He has a lifetime of experience with building diagnostics and construction. For 40-plus years he has been involved with further learning in the design, construction, and commissioning of a wide variety of building systems. He has been asked to solve building science and air quality problems and conducted a variety of testing in most types of buildings.

Representing Maine Indoor Air Quality Council
bturner@turnerbuildingscience.com

Charles Van Winkle

Prior to his current role as director of energy services at Housing Vermont, Charles Van Winkle held several positions in the renewables industry, including leadership positions with a local energy storage integrator, utility solar monitoring company, community-scale (100 kW) wind turbine manufacturer, and off-grid power systems integrator. Charlie's microgrid experience includes offshore oil and gas platforms, oil pipelines in Papua New Guinea and Georgia, and wind diesel installations in western Alaska.

Housing Vermont • cvanwinkle@hvt.org

Kevin Vidmar

Kevin Vidmar is the vice president of energy services for Loureiro Engineering Associates. Kevin has over 30 years of industrial experience, working with worldwide sites on their energy reduction opportunities. He has a B.S. degree from Miami University, and an M.S. degree from Vanderbilt University and is a certified energy manager, certified energy auditor, and certified professional in energy management systems.

Loureiro Engineering Associates • kvidmar@loureiro.com

Chris West

Chris West has been a certified Passive House consultant (CPHC) since 2011 and a PHIUS CPHC trainer since 2018. Chris has been a longtime advocate for superinsulated houses as a path toward reduced carbon emissions, heightened comfort, healthy environments, and safe living spaces. His small consultancy has been involved in many certified and un-certified houses and multifamily projects in Vermont, New Hampshire, and elsewhere.

Eco Houses of Vermont • info@ecohousesofvt.com

Ali White

Ali White, CEM, is an energy consultant in VEIC's engineering division, providing technical analysis and project management to commercial and industrial customers. Her skill set includes conducting energy audits, identifying innovative and cost-effective energy efficiency measures, and project prioritization through comprehensive energy and non-energy benefit analyses. Ali provides refrigeration, HVAC, lighting, and process efficiency services to the grocery, brewery, and dairy manufacturing sectors, with a specific focus on refrigerant management, refrigerant conversion, and leak repair in large refrigeration systems.

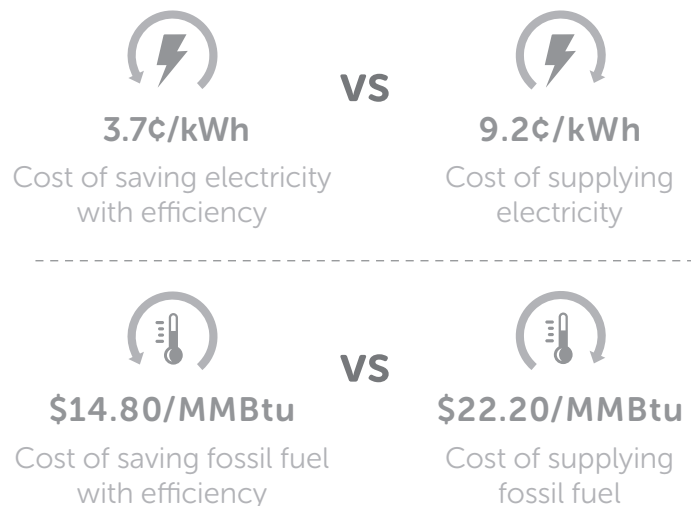
Efficiency Vermont • ajwhite@veic.org

Li Ling Young

Li Ling Young works through Efficiency Vermont to support the design and construction of healthy, comfortable, energy-efficient homes. For the last five years, Li Ling has focused on the challenges of upgrading Vermont's existing housing stock for an energy-constrained and carbon-taxed future. Through direct consultation, instrumentation and monitoring of energy retrofit projects, and analysis, Li Ling's work has supported a cost-optimized approach to home zero energy retrofits.

Efficiency Vermont • lyoung@veic.org

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Randy Drury
802-477-5258 • randy@3ethermal.org
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BRINC Building Products, Inc.

Booth: 55

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BRINC Building Products is a high-performance building material manufacturer headquartered in New Bethlehem, PA. Our mission is to provide simple, innovative, and effective building envelope solutions for the U.S. and Canadian markets. BRINC BP is the manufacturer of ThermalBuck, the high-performance window buck. ThermalBuck solves a number of common issues architects and builders face when installing windows and doors with continuous insulation and / or rain screens.

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Building Performance Professionals Association of Vermont

Booth: Second Floor

Jonathan Dancing
802-552-4677 • jdancing@bppa-vt.org
www.bppa-vt.org

BPPA-VT is a trade association supporting building performance contractors and allied professionals. Mission statement: Representing our members as we work to promote Vermont's building performance industry and to ensure the energy efficiency, comfort, and safety of our residential and commercial buildings.

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Chris Burns
802-865-7300 • cburns@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. As the first U.S. city to source 100% of its power from renewable generation, BED works closely with its community partners to deliver cost-effective energy solutions on behalf of ratepayers.

Carroll Concrete

Booth: 30

Jeffrey Stocker
603-863-1000 • jstocker@carrollconcrete.us
www.carrollconcrete.com

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Booth: 60

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802-734-0254 • bcurley@charroninc.com
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For over 50 years, the Charron organization has been selling and servicing specifiers, distributors, and electrical contractors in Northern New England. The Charron line card represents the finest package of lighting and control manufacturers available in the territory.

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Booth: 2 & 3

Melissa Stephen
802-728-3376
mstephen@dubois-king.com
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DuBois & King is an employee-owned, multidisciplinary professional consulting firm that provides planning, engineering, site development, energy production, natural resources, water / wastewater, transportation, and construction phase services.

Efficiency Excellence Network

Booth: Lobby

Allison Fode
802-540-7859 • afode@veic.org
www.contractors.efficiencyvermont.com/efficiency-excellence-network

The Efficiency Excellence Network (EEN) is an association of independent contractors, designers, and other professionals committed to providing their customers the highest level of energy efficiency services.

Efficiency Vermont

Booth: Lobby

Rebecca Foster
888-921-5990 • rfoster@veic.org
www.efficiencyvermont.com

Efficiency Vermont is helping to transition Vermont to a more affordable and cleaner future. Efficiency Vermont works with partners throughout Vermont to save customers money, strengthen our state's economy, and lower carbon emissions. Efficiency Vermont advances sustainable energy solutions for all Vermont homeowners and businesses through education, services, and incentives.

EFI

Booth: 20

Jed Crawford
800-876-0660 • jcrawford@efi.org
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EFI empowers the relationship between utilities and their customers. With over 75 utility branded online marketplaces and the new rebate-as-a-service smartphone-based tools, EFI engages, educates, and moves customers to action, meeting goals for energy savings. Serving more than 50 million consumers with disruptive technology and a proven engagement platform, EFI provides a personalized experience that results in high customer satisfaction and the adoption of needed energy savings technology.

Emerson Swan, Inc.

Booth: 22 & 23

Todd Daniels
781-986-2000 • tdaniels@emersonswan.com
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Founded in 1932 by Thomas J. Swan Sr., Emerson Swan, Inc. is one of the largest stocking manufacturer's representative organizations in the United States, with offices in Randolph, MA; Rocky Hill, CT; Falmouth, ME; Buffalo, NY; Pittsburgh, PA; Columbus, OH; Livonia, MI, and Milton, ON. Emerson Swan, Inc., serves quality residential and commercial heating, plumbing, and HVAC equipment customers.

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Energy Panel Structures

Booth: 15

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Booth: 10

Lisa Lynch
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Flynn & Reynolds is a manufacturer's representative agency in the electrical industry. We represent manufacturers in the lighting, heat, ventilation, controls, boxes, pipe, wire, and fittings categories.

Foard Panel Inc.

Booth: 25

Alison Moynihan
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Foard Panel is a structural insulated panel (SIP) manufacturer and installer. Foard has been manufacturing and installing high-performance building systems for 30-plus years.

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Global Wholesale Supply is the supplier for Steico wood fiber insulation products and Nature Fibres hemp batt insulation in the U.S.

Green Mountain Electric Supply

Booth: 58

Karen Laber
802-338-9336 • karenl@gmes.com
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Green Mountain Electric Supply is a third-generation family-owned and -operated electrical wholesaler serving New England and New York for over 60 years. We are a leader in energy-efficient solutions including LED technology, lighting retros, energy audits, EV charging stations, and PV solar.

Green Mountain Solar

Booth: 47

Paul Lesure
802-369-9149 • paul@greenmntsolar.com
www.greenmntsolar.com

Green Mountain Solar proudly serves residential, commercial, and municipal clients throughout the state of Vermont. We are a small but strong solar business, which means we have a low overhead and can pass those savings on to you. All of our installations are performed by our in-house staff—never subcontracted.

H.L. Turner Group Inc.

Booth: 46

Rachel Marden
603-244-0765 • rarden@hlturner.com
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Huber Engineered Woods is the manufacturer of Advantech and ZIP System brand engineered panel products as well as accessories to complement the panels. Family owned for six generations, Huber is dedicated to innovation and sustainability.

Kingspan Insulation

Booth: 17

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Kingspan Insulation LLC, headquartered in Atlanta, GA, is a leading manufacturer in energy efficiency and moisture management products, offering high-performance insulation, building wraps, and pre-insulated HVAC ductwork. The vast product range includes optimum, premium, and high-performance rigid insulation products, which have many advantages over traditional insulation materials. Our products are among the most thermally efficient and technologically advanced insulation materials available.

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Michael Flatt
972-497-5305 • michael.flatt@lennoxind.com
www.lennox.com

Lennox is a manufacturer of high-efficiency HVAC equipment.

LFD Solutions

Booth: 12

Jeff Mann
603-498-3421 • jeff@lfdolutions.net
www.lfdolutions.com

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Mitsubishi Electric Trane HVAC LLC

Booth: 61

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Needham Electric Supply

Booth: 43 & 44

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New England Foam and Coating, Inc.

Booth: 56

Shannon Chapman
802-748-5600 • newenglandfoam@myfairpoint.net
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New England Foam and Coating, Inc., has been serving efficiency-minded builders and clients since 2001. We offer a vast array of services including, but not limited to: open / closed cell spray foam, cellulose, and polyurea coatings.

North Country Mechanical Insulators

Booth: 11

Eric Simpson
802-863-0027 • eric@ncmiinc.com
www.ncmiinc.com

Mechanical insulation contractor that focuses on new construction as well as retrofit. We offer complimentary mechanical insulation energy appraisals and can calculate the payback period of insulation.

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info@dubois-king.com
802.878.7661

DuBois & King (D&K) has long committed its building engineering services to promoting and implementing responsible energy practices, including conservation measures, energy efficiency, and sustainable design principles that seek to respect our natural resources.

D&K's mechanical and electrical engineers:

- Sustain a client-focused, results-oriented philosophy
- Have an in-depth understanding of the client's needs
- Collaborate through the design and construction phases
- Support imaginative thinking and courageously challenge conventional engineering
- Desire to push the design conversation toward well-developed smart projects

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www.GLAVEL.com

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

Office Environments

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James Farrington
802-864-3000 • jfarrington@oei-vt.com

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ParksiteSilver Sponsor, Healthy Homes Track
Booth: 26Martin Petteys
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 & Doors

Booth: 57

Nathan Luippold
413-512-5995 • nluippold@pellasales.com
www.pellaburlington.com

Pella Windows & Doors is a leading provider of high-quality, energy-efficient windows and doors. Pella offers a wide variety of products that help contractors, builders, homeowners, and developers meet their fenestration needs.

Pinnacle Window Solutions

Booth: 42

Kristopher Brill
207-588-6590 • Kris@pinnaclewindowsolutions.net
www.pinnaclewindowsolutions.net

With a strong focus on high-performance windows, Pinnacle Window Solutions has separated itself as a true industry leader servicing the New England design and build community. With 70 years of combined experience, Pinnacle Window Solutions has the expertise and knowledge to guide you through the most challenging window and door projects imaginable.

Preferred Building Systems

Booth: 1

Sherri Hurd
603-372-1050 • shurd@preferredbuildings.com
www.preferredbuildings.com

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rk Miles, Inc.

Booth: 19

Nick Stone
802-549-5664 • stonen@rkmiles.com
www.rkmiles.com

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RAB Lighting

Booth: 41

Bob Meade
201-784-8600 • bob@rabweb.com
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Rettig USA is a division of Rettig ICC (Indoor Climate Comfort). Rettig is a leading manufacturer and distributor of hydronic radiators, fan convectors, hydronic components, and towel warmers. The Rettig family of brands includes Myson, Purmo, MMA, Vogel & Noot, Emmeti, and Hewing.

Rheem Water Heaters

Booth: 18

Diane Cabral
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www.rheem.com

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Rockwool

Silver Sponsor / Booth: 50

Pamela Jay
905-878-8474 • pamela.jay@rockwool.com
www.rockwool.com

At the ROCKWOOL Group, we are committed to enriching the lives of everyone who experiences our solutions. Our expertise is perfectly suited to tackling many of today's biggest sustainability and development challenges, from energy consumption and noise pollution to fire resilience, water scarcity, and flooding.

Rothoblaas USA Inc.

Bronze Sponsor / Booth: Second Floor

Eleonora Dalfovo
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RST Thermal, Inc

Booth: 59

Maryellen Hickey
781-320-9910 • mehickey@rstthermal.com
www.rstthermal.com

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Runtal North America

Booth: 28

Jonathan Wiberg
603-770-2078 • jonathan.wiberg@runtalnorthamerica.com
www.runtalnorthamerica.com

Founded over 60 years ago in Switzerland and manufacturing in the U.S. for over 30 years, Runtal offers an array of decorative radiators and towel radiators (towel warmers) for hot water (hydronic), steam, and electric heating systems. Runtal radiators are attractive, durable, hygienic, comfortable, and energy efficient. The choice of leading architects and designers, they may be discreetly blended into a classic decor or complement today's modern designs.

Sierra Pacific Windows

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Siga

Booth: 16

Marc Coviello
802-917-3142 • marc.coviello@siga.swiss
www.siga.swiss

Today, approximately 50% of the world's energy requirements are dedicated to heating and cooling buildings. This affects the environment and accelerates climate change. We are committed to creating energy-efficient buildings to stop this progression. We strive for a world of zero energy loss buildings.

SK & Associates

Booth: 27

Dave Viveiros
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.

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David Joyce
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HVAC representative for Comfort Star, Nest, and Quick Sling.

Stiebel Eltron, Inc.

Bronze Sponsor / Booth: Second Floor

Francesca Palazzo
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www.stiebel-eltron-usa.com

This family-owned business is known worldwide for its engineering and manufacturing expertise and its drive to develop innovative products with greater energy efficiency, convenience, and reliability.

SunCommon

Booth: 24

Erin Rocheleau
802-398-7118 • erin.rocheleau@suncommon.com
www.suncommon.com

We are SunCommon. Our mission is to make clean, renewable energy simple and affordable. We offer options through home solar, community solar, solar heating and cooling, and battery storage—all at no up-front cost. It is easy to take the first step toward a brighter future with SunCommon.

SunWood Biomass

Booth: 45

Dave Frank
802-496-6666 • dave@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.

Unity Homes

Booth: 35

Andrew Dey
603-756-3600 • andrew@unityhomes.com
www.unityhomes.com

Unity Homes builds high-performance homes throughout the Northeast using off-site construction methods that yield predictable quality, schedules, and costs.

Urell

Booth: 51 & 52

Mallory Leahy
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www.urell.com

URELL is the premier manufacturers' representative servicing New England in partnership with quality manufacturers and wholesale distribution.

VBRA

Booth: Second Floor

Maureen Cregan Connolly
802-876-6200 • mcconnolly@homebuildersvt.com
www.homebuildersvt.com

Vermont Builders and Remodelers Association is a trade association committed to supporting best practices within the building industry.

VEIC

Jim Madej
802-540-7725 • jmadej@veic.org
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VEIC is a leader in the design and delivery of energy efficiency and renewable energy services for residents, businesses, and industrial customers.

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Vermont Business Magazine

Bronze Sponsor / Booth: Second Floor

John Boutin
802-863-8038 • john@vermontbiz.com
vermontbiz.com

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

Vermont Department of Health

Booth: Second Floor

Marielle Strong
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 Department of Environmental Conservation and Thermostat Recycling Corporation (TRC)

Booth: Second Floor

Karen Knaebel
802-522-5736 • karen.knaebel@vermont.gov
www.vtrecycles.com and thermostat-recycle.org

Vermont Department of Environmental Conservation oversees five different free manufacturer-funded recycling programs for certain electronics, paint, batteries, and mercury-containing bulbs. The Department will be joined by the Thermostat Recycling Corporation, which is also one of the manufacturer-funded programs in Vermont that provide a \$5 per mercury thermostat incentive for thermostats dropped off at Vermont locations for recycling.

Vermont Eco-Floors

Bronze Sponsor / Booth: Second Floor

Karen Frost
802-425-7737 • 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 Corp.

Booth: 40

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www.vtenergy.com

Residential and light commercial HVAC contractor, specializing in heat pump technology.

Vermont Gas Systems

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Evening Reception on Wednesday
Booth: 4 + 5

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Vermont Green Building Network

Booth: Second Floor

Jenna Antonino DiMare
802-735-2192 • vermontgbn@gmail.com
www.vtgreenbuildingnetwork.org

Founded in 2002, the Vermont Green Building Network (VGBN) works to advance the environmental, economic, community, and health benefits of green design, construction, and building operation practices.

Vermont Insulated Concrete Forms

Booth: 7

Joel Baker
802-793-0673 • vticf@aol.com
www.vticf.com

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Vermont Passive House—VTPH

Booth: Second Floor

Chris Clarke Miksic
802-249-1052 • chris@montpelierconstruction.com
www.vermontpassivehouse.org

Vermont Passive House (VTPH) is a nonprofit organization whose mission is to promote the Passive House building energy standard in Vermont. Through public outreach, education, advocacy, and training, VTPH provides opportunities for practitioners, industry professionals, policymakers, and the general public to collaborate and participate in a shared mission, ensuring the success and vitality of the Passive House building energy standard.

VHV Company

Booth: 29

Mallory Fischer
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 and is a one-stop shop for mechanical services.

Visible Light

Booth: 48 & 49

Scott Kimball
603-918-6496 • skimball@visible-light.net
www.visible-light.net

Our organization provides sales, service, and design support to the specification design community as well as the electrical contracting and distribution community. We offer many lines that are leaders in the commercial and industrial space as well as the agricultural industry.

VSECU

Bronze Sponsor / Booth: Second Floor

Laurie Fielder
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www.vsecu.com

A credit union inspiring a movement that brings people together, empowers them, and opens up possibilities for greater financial, environmental, and social prosperity.

Windows & Doors By Brownell

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Booth: 8 & 9

Jackie Turtur
802-862-4800
jackie@wdbrownell.com
www.wdbrownell.com

Windows & Doors By Brownell is family owned and operated and committed to Marvin, since 1991. Our goal is to provide excellent customer service, the best quality product, and services to match.



Wythe Windows

Booth: 33

Darren Macri
201-962-7444 • darren@wythewindows.com
www.wythewindows.com

Wythe Windows manufactures high-performance Passive House quality tilt turn windows and doors in New Jersey! We offer customizable solutions with competitive prices and amazing lead times.

Zehnder America

Silver Sponsor, Building Systems Track / Booth: 32

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Zehnder Heat Recovery Ventilators / Energy Recovery Ventilators ensure fresh filtered air and a healthy atmosphere for the home year-round. Zehnder Comfosystems are custom designed with perfectly matched air distribution components for easy installation. Whether a Passive House construction, a high-performance home, or a new home subject to stricter building codes, Zehnder's Comfosystems provide the highest standard for quiet operation, energy efficiency, indoor air quality, and performance.

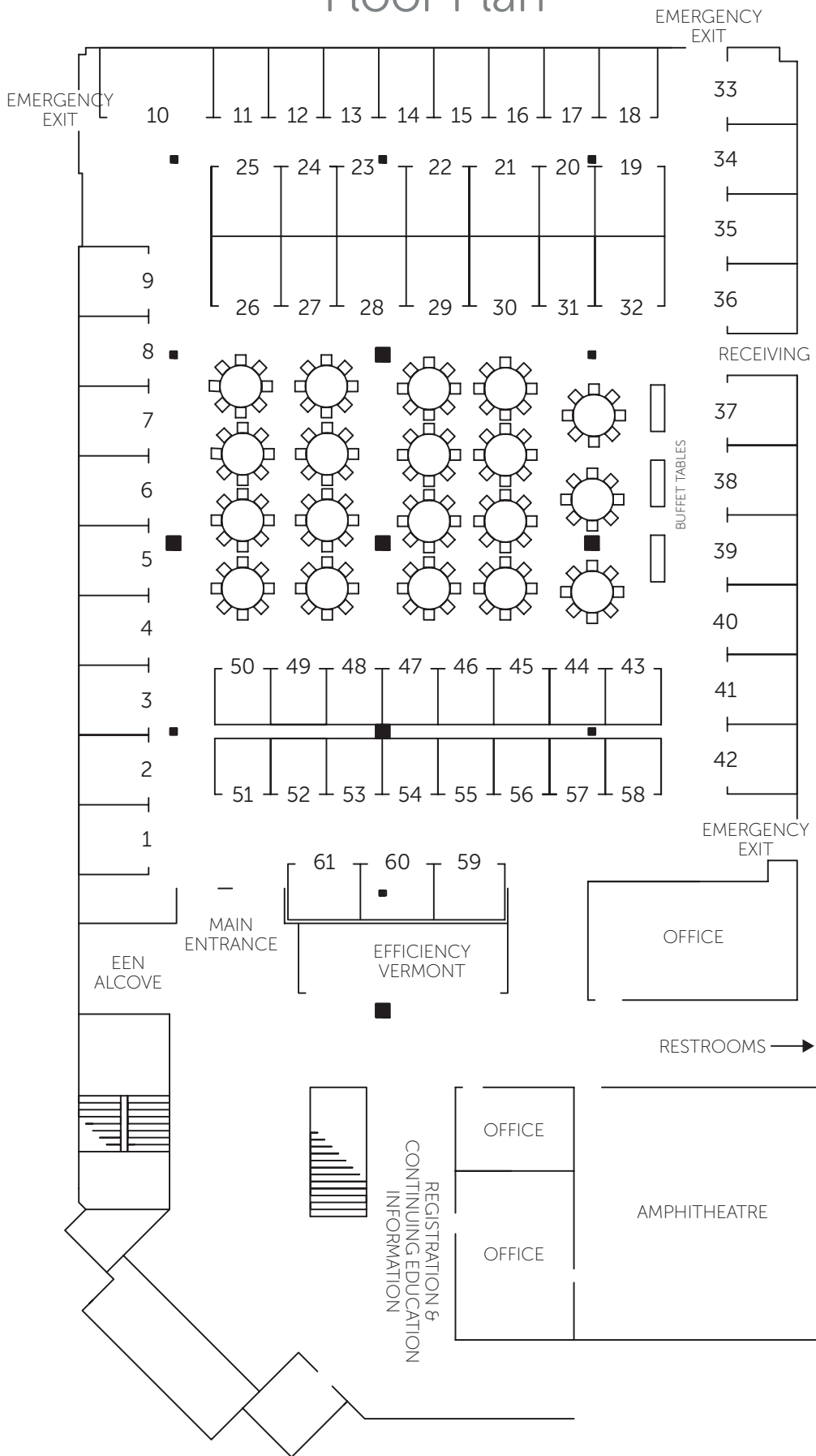
Zone 6 Energy

Bronze Sponsor / Booth: Second Floor

Nate Gusakov
802-458-2386 • goose@zone6energy.com
www.zone6energy.com

Zone 6 Energy offers expert air-leakage consulting, diagnostics, and air-sealing services. In addition to performing residential-scale and commercial-scale blower door testing, we proudly install AeroBarrier envelope sealing technology.

Lake Champlain Exhibit Hall Floor Plan



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Thank You!

**Efficiency
Vermont**