



# 2023 Decarbonization Conference for the Built Environment

October 25th - October 27th, 2023

## Wednesday, October 25

Wednesday, October 25, 8:10 AM - 9:00 AM

### Keynote

**Chris Turner**

### How to be a Climate Optimist

*Room: Salon 4*

Energy transition strategist Chris Turner presents a powerful case for optimism in the face of the challenge of climate change. Turner has been reporting on clean energy, sustainable business, and smart green design the world over since long before any of these were mainstream interests, and he draws on the full breadth of his extensive reporting to paint a vivid portrait of a global energy transition already tackling the climate crisis and pointing the way to a much brighter future. Turner's presentation illustrates not just the viability but the deep desirability of decarbonization -- for the built environment and beyond.

Wednesday, October 25, 9:10 AM - 10:10 AM

### Panel 1 (Intermediate)

### ASHRAE Decarb Guidebook Panel

*Room: Salon 4*

*Chair: Troy Savage<sup>1</sup>*

*Panelists: Heather Burpee<sup>2</sup>, Austin Barolin<sup>1</sup> and Christina Sanborn<sup>1</sup>, (1)Mazzetti, San Francisco, CA(2)University of Washington, Seattle, WA*

Rather than “doing no harm,” healthcare is actively fueling the carbon fire. In response, ASHRAE commissioned a healthcare decarbonization guide, and the California Energy Commission sponsored decarb:Healthcare. In this interactive session with authors of the ASHRAE and CEC guides, we share a peek “under the hood” at the collaborative guidebook currently in development — technologies and methods that will be key to decarbonizing our healthcare systems. You will learn best practices in hospital design, review case studies from new healthcare decarbonization projects, and hear about the ideas for motivation and incentive programs to implement decarbonization.

9:10 AM - 10:10 AM  
Panel 2 (Intermediate)

## Moving Decarbonization from Theory to Reality

Room: Studio E

Chair: Xudong Wang, PhD, Full Member, Air-Conditioning, Heating and Refrigeration Institute (AHRI), Arlington, VA, Panelists: Stephen Yurek, Air-Conditioning, Heating, and Refrigeration Institute, Arlington, VA, Katrina Metzler, National Energy and Utility Affordability Coalition, Washington, DC, DC and Don Davis, Building Owners and Managers Association (BOMA), Washington, DC, DC

Federal, state, and local governments across North America are evaluating strategies to reduce greenhouse gas (GHG) emissions across building sectors. The US HVACR and Water heating industry has been playing a key role in achieving the nation's decarbonization goal. Panelists from the industry will discuss some key unanswered questions about the economic, technical, and logistical feasibility of decarbonization strategies for building space and water heating. The discussion will also cover technology pathways, environmental and equity justice from perspectives of manufacturers, consumers and building operators.

9:10 AM - 10:10 AM  
Seminar 1 (Intermediate)

## Strategies to Achieve Low Carbon Operations: Tackling Overlooked Elements of Embodied and Operational Carbon

Room: Studio D

Chair: Manny Garcia, effecterra, Reno, NV

Part 1: Current life cycle assessment software applications offer powerful computational capabilities to estimate embodied carbon in the built environment. However, various challenges are encountered when applying these tools for certain use cases, in particular tenant improvements. We will discuss pragmatic approaches for estimating the embodied carbon from tenant improvements. Part 2: Operational Carbon cannot be minimized without tackling refrigerants. Current refrigerants are very potent greenhouse gases and can account for 20-30% of an organization's Scope 1 emissions. We will discuss how federal and state regulations will help reduce the climate threat from refrigerants and how we can do more.

### 1. Strategies to Achieve Low Carbon Operations: Tackling Overlooked Elements of Embodied Carbon

Manny Garcia, effecterra, Reno, NV

### 2. Strategies to Achieve Low Carbon Operations: Tackling Overlooked Elements of Operational Carbon

Michael May, Member<sup>1</sup> and Manny Garcia<sup>2</sup>, (1)Effecterra Inc, Reno, NV, (2)effecterra, Reno, NV

9:10 AM - 10:10 AM  
Seminar 2 (Intermediate)

## What Should I Know: Understanding the Existing and New Decarbonization Policies

Room: Studio B

Chair: Harry Bergmann, Associate, U.S. Department of Energy, Oak Ridge, TN

There are a number of programs and policies already in place and there are a number of them that are being developed across the USA that could help decarbonize the built environment. This session will dig deep into the US Department of Energy's State and Community Program that includes adoption of the latest model codes, zero energy codes and building performance standards, and how those strategies align with the Inflation Reduction Act. In addition, there will be clarification for the developing policies, in hopes that they will provide a harmonized system for regulations, that are envisioned by the policymakers.

### 1. Decarbonization through Innovative Building Codes and Performance Standards

Harry Bergmann, Associate, U.S. Department of Energy, Washington, DC

### 2. Decarbonization Drivers: Guidelines, Standards and Regulations

Helen A Walter-Terrinoni, Full Member<sup>1</sup> and Jennifer Kane<sup>2</sup>, (1)Trane Technologies, Skaneateles, NY, (2)Trane Technologies, Washington, DC

Wednesday, October 25, 10:30 AM - 12:00 PM

**Panel 3 (Basic)**

**Building Industry Decarbonization Collaboration**

*Room: Studio E*

**Sponsor: TFBD ExCom**

*Chair: Clay Nesler, The Nesler Group, Fort Myers, FL*

*Panelists: Ginger Scoggins, Engineered Designs Inc, Cary, NC, Billy Grayson, Urban Land Institute, Washington, DC, Laurie Kerr, U.S. Green Building Council, Washington, DC, Emily Grandstaff-Rice, AIA, Don Davis, Building Owners and Managers Association (BOMA), Washington, DC, DC and Laurie Gilmer, IFMA, Houston, TX*

Building industry collaboration can have a critical role in educating and training industry professionals and stakeholders on building decarbonization strategy, policies, and practices. Representatives from AIA, ASHRAE, BOMA, IFMA, ULI and USGBC will provide an overview of their organization's building decarbonization activities; discuss why building decarbonization is important for their members; and share how greater industry collaboration can accelerate building decarbonization planning and progress.

10:30 AM - 12:00 PM

**Panel 4 (Basic)**

**Drivers for Decarbonization: Model Codes, Zero Codes and Building Performance Standards**

*Room: Salon 4*

*Chair: Harry Bergmann, Associate, U.S. Department of Energy, Oak Ridge, TN*

*Panelists: Bing Liu, PE, Fellow Member, Pacific Northwest National Laboratory, Portland, OR, Katie Bergfeld, DC DOEE, Washington, DC and Adam W Hinge, PE, Fellow Member, Sustainable Energy Partnerships, Tarrytown, NY*

Experts from industry, government, and research will convene for a mix of presentations and discussion around the role that model codes, zero energy codes, and building performance standards can play in decarbonizing the building stock. The underlying question will push panelists to offer solutions to enable a lifecycle-approach to building energy and emissions management. Audience participation through Q&A will be encouraged.

10:30 AM - 12:00 PM

**Panel 5 (Basic)**

**Impact for Decarbonization: Existing Building Policies, Perspectives from the field on Building Performance Standards**

*Room: Studio B*

*Chair: Carolyn Sarno Goldthwaite, ClearlyEnergy, Bedford, MA*

*Panelists: William M Goodrum, PE, CEM, CMVP, Member, NORESO, Monroeville, PA, Randall Higa, Southern California Edison, Pasadena, CA, Crystal Egelkamp, Colorado Energy Office, Denver, CO, Nicholas L Long, PE, Full Member, NREL, Lakewood, CO, United States and John Balfe V, Northeast Energy Efficiency Partnerships (NEEP), Boston, MA*

Existing building decarbonization plays a key role in reducing the impact of buildings on the climate crises. Existing building policies, like energy benchmarking and building performance standards, are a method for driving decarbonization in existing building stock. These policies impact a wide group of stakeholders, and this panel brings together experts from several key stakeholder groups to share perspectives on development and implementation of equitable existing building policy. Panelist from national laboratories, state government, non-governmental organizations, utilities, software providers and code consultants will engage with the audience to discuss approaches for equitable and sustainable building decarbonization through existing building policies.

10:30 AM - 12:00 PM

**Panel 6 (Intermediate)**

**Net-Zero Network: Decarbonizing Buildings Through Digital Documentation**

*Room: Studio D*

*Chair: Derek Supple<sup>1</sup>*

*Panelists: Leigh-Golding DeSantis<sup>1</sup> and David Ross<sup>2</sup>, (1)Johnson Controls(2)ESG Climate and Infrastructure Advisory (KPMG)*

To achieve net zero and meet environmental regulations, it's critical that building owners accurately assess carbon footprints, set emissions targets, manage emissions and track progress for reporting. Complicated spreadsheets are not going to cut it. Instead, advanced digital data collection and analytics make it possible for building owners to effectively manage scope 1 and 2 emissions and generate reports for major certification and compliance frameworks. This presentation demonstrates how digital documentation simplifies accurate emissions assessment, target-setting, tracking and reduction management from the facility to enterprise level.

Wednesday, October 25, 1:40 PM - 3:10 PM

**Panel 7 (Intermediate)**

**Leading by Example to Decarbonize the Building Stocks: Strategies, Best Practices and Financial Options from the Federal Programs in U.S.**

*Room: Salon 1-4, 2nd floor*

*Chair: Bing Liu, PE, Fellow Member<sup>1</sup>, Mary Sotos<sup>2</sup>, Kinga Porst Hydras<sup>3</sup>, Lindsey Falasca<sup>4</sup> and Hayes Jones<sup>2</sup>, (1)Pacific Northwest National Laboratory, Portland, OR(2)U.S. Department of Energy, Washington DC, DC(3)General Service Administration, Washington DC, DC(4)White House Council on Environmental Quality, Washington, DC*

The global climate crisis demands urgent action. The Biden-Harris Administration has taken a bold step by setting an ambitious target of achieving net-zero emissions in buildings by 2050, with 50% reduction by 2035. To shed light on strategies for achieving low carbon buildings, retrofitting best practices, and funding options for low carbon building projects, we are honored to have a panel of distinguished leaders from the Building Technologies Office and Federal Energy Management Program Office at the U.S. Department of Energy, the White House Council on Environmental Quality and General Service Administration to provide valuable insights into this critical issue.

1:40 PM - 3:10 PM

**Panel 8 (Intermediate)**

**Lessons Learned from the Trenches of Decarbonization**

*Room: Studio E*

*Chair: Emma Hughes, RE Tech Advisors, McLean, VA*

*Panelists: Jim Landau, MetLife, Washington, DC, Jennifer McConkey, Principal Real Estate Investors, Des Moines, IA, Emily McLachlan, Federal Realty Investment Trust, Washington, DC and David Natt, Avanath Capital Management, Philadelphia, PA*

This session presents a deep dive into how real estate companies are implementing strategies to decarbonize their assets and portfolios. Moving beyond the process of setting targets – the session will provide concrete, actionable strategies that industry professionals can use to move the needle on carbon emissions reductions and identify common pitfalls to avoid.

Presenters will share their unique perspective on how they are translating their company's targets into comprehensive carbon reductions at individual facilities or properties. They will discuss what it takes to successfully implement market-leading carbon reduction programs that drive meaningful reductions.

1:40 PM - 3:10 PM

**Panel 9 (Basic)**

**Embodied Carbon Harmonization and Optimization (ECHO) Project**

*Room: Studio D*

**Sponsor: 2.5 Global Climate Change**

*Chair: Andrew Himes, Carbon Leadership Forum*

*Panelists: Jessica Bristow, ILFI, Melissa Morancy, AIA, Katie Poss, Building Transparency, Lauren Alger, Infrastructure, Pamela Conrad, Climate Positive and Kayleigh Houde, BuroHappold, Los Angeles, CA*

Reducing the carbon footprint of the built environment is possible, but it will require collaboration to foment the needed market transformation toward regenerative carbon strategies in the coming years and decades.

During this panel you will hear from individuals that are part of Architecture 2030, MEP 2040, Carbon Leadership Forum and more.

Together, they are working toward streamlined carbon data collection and reporting, key terminologies, consolidated industry capacity building, and speaking together with a harmonized voice on the topic of whole life carbon.

1:40 PM - 3:10 PM

**Panel 10 (Advanced)**

**Paradigm Shift: How Building Performance Standards Reshape How Building Owners Plan for Building Updates and Renovations**

Room: Studio B

Chair: Theresa Backhus, LEED AP, Institute for Market Transformation, Washington, DC,

Panelists: N. Scott Emery, PE, Full Member, Baumann Consulting, Washington, DC, Nigel Twose, Board at Shoreham West Cooperatives, Washington, DC, Charles E Kirk, P.E., Full Member, TRC Engineering, Gaithersburg, MD and Matthew Borger, Donohoe Commercial Real Estate, Bethesda, MD

Building Performance Standards are gaining regulatory ground in efforts to decarbonize the built environment. Washington, DC's Building Energy Performance Standard (BEPS) was signed into law in 2019 and is now two and a half years into its first cycle. DC owners of every building type are taking steps to reduce energy use and bring their buildings up to the standard. This panel of DC based stakeholders shares how DC's BEPS is changing the existing building market. The panel explains policy basics, addresses policy-related challenges and opportunities, and shares examples of implementation successes.

Wednesday, October 25, 3:30 PM - 5:00 PM

### Seminar 3 (Intermediate)

## Applying GHG Emission Reduction Audits to Decarbonize Buildings

Room: Studio E

Chair: Nora Hart, Lawrence Berkeley National Lab, Berkeley, CA, Stet Allen Sanborn, AIA, Full Member, Smithgroup, Washington, DC, Barry C Abramson, Life Member, Servidyne, LLC, Atlanta, GA and Hannah Debelius, U.S. Department of Energy

With many organizations making ambitious public commitments to reducing their operational greenhouse gas emissions, there has been a shift in the building industry from a focus on energy efficiency to decarbonization. This panel will discuss how typical energy audits can be augmented to develop a plan for systematically decarbonizing buildings. A DOE representative will briefly present a recently published resource titled, GHG Emissions Reduction Audit: A Checklist for owners, an ASHRAE 211 expert will share how the 211 Informative Appendix will be updated to include decarbonization, and there will be a discussion on how audits can enable impactful decarbonization.

### Applying GHG Emission Reduction Audits to Decarbonize Buildings

*Hannah Debelius, U.S. Department of Energy*

3:30 PM - 5:00 PM

### Seminar 4 (Intermediate)

## Benchmarking and Reductions: Evaluation Processes and Whole Life Carbon Approach

Room: Studio D

Chair: Luke C H Leung, PE, Fellow Member, Skidmore Owings & Merrill, Chicago, IL

Understanding the decarbonization process is critical for the ability for the owners, operators, and designers to evaluate the process to benchmarking your facilities. Having an informed team on how to perform the benchmarking process is critical to understanding your starting point on the path to carbon neutral. The path to achieving those goals must include the concern over current emissions from grid connected equipment and the future expected electric grid emissions rate over the span of the project expected life and sensitivity analysis. This process focuses on whole life carbon zero, and beyond, to arrive at a low entropy future.

### 1. Whole Life Carbon and Beyond to a Sustainable Future

*Luke C H Leung, PE, Fellow Member, Skidmore Owings & Merrill, Chicago, IL*

### 2. An International Portfolio Perspective: Carbon Measurement, Benchmarking and Reduction

*Danielle Khoo, PE, Associate, Marriott International*

### 3. Decarbonization 101: Exergy-Based Measures, Metrics and Terminology

*Birol I Kilkis, Ph.D., Fellow Life Member, OSTIM Technical University, Ankara, Turkey*

3:30 PM - 5:00 PM

### Seminar 5 (Intermediate)

## Reducing Emissions through Policy, Planning and Action

Room: Studio B

Chair: Coral Winona Pais, P.E., Full Member, DLR Group, Omaha, NE

In an effort to address climate change and move towards decarbonization of buildings, policymakers across the country are enacting building performance laws that require buildings and agencies to meet certain performance standards. This session will review trends across the country that are driving building-focused legislation and codes and ways in which institutions are at the forefront in raising awareness and providing support to those impacted by these standards. This session will also provide a

detailed review of how a government agency like the DC Department of Government Services developed an Energy Management Plan to reduce emissions.

**1. Building Performance Standards: Driver of Decarbonization**

*Theresa Backhus, LEED AP, Institute for Market Transformation, Washington, DC*

**2. The Role of Energy Management Planning in Reducing Carbon Emissions**

*Jen Croft, Department of General Services, Washington, DC*

**3. Implementation of Energy Management Planning**

*Jui-Chen Roger Chang, P.E., BEMP, Fellow Member, Buro Happold, Washington, DC*

3:30 PM - 5:00 PM

**Seminar 6 (Intermediate)**

**Update on ASHRAE's Decarbonization Guides**

*Room: Salon 4*

**Sponsor: TFBD**

*Chair: Blake E Ellis, PE, Fellow Member, Burns & McDonnell, Kansas City, MO*

ASHRAE is in the process of developing six (6) decarbonization guides. Each of the guides covers a different segment of decarbonization. A member from the ASHRAE working groups that led the development of the guide will provide insight into the purpose of the guide and the intended audience. For guides that will have already been published, a deeper overview of the guide will be presented than what can be gathered through the table of contents. For guides that are still under development, this seminar provides the audience with a sneak peek at the content of the guide.

**1. Building Performance Standards: A Technical Resource Guide Update**

*Adam W Hinge, PE, Fellow Member, Sustainable Energy Partnerships, Tarrytown, NY*

**2. Grid Interactive Buildings for Decarbonization: Design and Operation Resource Guide Update**

*Katherine G Hammack, CEM, LEED-AP, GBCI, Neskowin, OR*

**3. Whole Life Carbon Guide for Building Systems Guide Update**

*Michael P Deru, PhD, Full Member, NREL (National Renewable Energy Lab), Lakewood, CO*

**4. Building Decarbonization Retrofits for Commercial and Multifamily Buildings Guide Update**

*Ted Michael Tiffany, Building Decarbonization Coalition, Member, Building Decarbonization Coalition, Santa Rosa, CA*

**5. Decarbonizing Hospital Buildings Guide Update**

*Timothy M Peglow, PE, SASHE, Associate, MD Anderson, Houston, TX*

**Thursday, October 26**

Thursday, October 26, 8:10 AM - 9:00 AM

**Keynote**

**Industry Executive Roundtable**

*Chair: Wade H Conlan, P.E., Member ASHRAE, BCxP, CxA, LEED®AP BD+C, Full Member, Hanson Professional Services, Maitland, FL*

*Ginger Scoggins<sup>1</sup>, Lakisha Woods<sup>2</sup>, Henry Chamberlain<sup>3</sup> and Laurie Gilmer<sup>4</sup>, (1)Engineered Designs Inc, Cary, NC, (2)The American Institute Architects, (3)BOMA, (4)IFMA, Houston, TX*

*Room: Salon 4*

The goal of this session is to highlight the organizations and their industry leaders, that created this event so they can address how the building industry can improve the impact buildings have on the global climate crises. The discussion focuses on the path forward for these organizations and how working together can reduce or reverse the impacts of the built environment on the global carbon footprint. This includes discussions on the roles of each member of the different organizations. The intent is to discuss macro level issues within the industry and to see where the built environment is shifting.

Thursday, October 26, 9:10 AM - 10:10 AM

**Panel 11 (Advanced)**

**Whole Life Carbon for Building Systems**

*Room: Studio D*

*Chair: Webly Lynn Bowles, Senior Project Manager, New Buildings Institute (NBI), Portland, OR*



Panelists: Ghina Annan, Stantec, Calgary, AB, Canada, Josh Jacobs, LEED AP+ BD&C, WAP Sustainability, Nashville, TN, Michael P Deru, PhD, Full Member, NREL (National Renewable Energy Lab), Lakewood, CO and Luke Leung, Principal of the Sustainability Engineering, Fellow ASHRAE, Skidmore, Owings and Merrill LLP, Chicago, IL

Mechanical, Electrical, and Plumbing (MEP) systems are the largest energy consumers and the largest source of operational carbon emissions in buildings; however, the embodied carbon, (i.e. emissions from the production, transportation, and installation of these components) is also important. Whole life carbon is a crucial concept that considers the total carbon footprint, including the operational carbon, refrigerant leakage, and the embodied carbon over the life of a building. A whole life carbon approach allows designers to focus on the carbon intensive components and the interaction between components. This session will provide strategies for reducing whole life carbon of MEP systems.

9:10 AM - 10:10 AM

### Seminar 7 (Intermediate)

## Decarbonization of Fully Occupied Public Housing

Room: Salon 4

Chair: John B Peavey, PE, Home Innovation Research Labs, Upper Marlboro, MD

This session describes the process of decarbonizing two existing, 3-story, multifamily building in Albany, NY. Each building, circa 1973, consists of eight 2-story apartments on the upper levels that are above seven 1-story apartments on the lower ground level. The decarbonization process will incorporate two phases. The first is a major retrofit of the building thermal envelope and the ventilation system. The second is the replacement of the existing natural-gas-fired domestic hot water and space heating system with an electric heat pump system. The retrofits will be accomplished while retaining full occupancy of the building.

### 1. Envelope Upgrades for Public Housing Decarbonization

John B Peavey, PE, Home Innovation Research Labs, Upper Marlboro, MD

### 2. Combined Electric Space Heating and Domestic Hot Water for Public Housing

Daniel H Nall, PE FAIA FASHRAE CPHC, BEMP and HBDP, Fellow Life Member, Daniel Nall, Consultant, LLC, Princeton, NJ

9:10 AM - 10:10 AM

### Seminar 8 (Advanced)

## Minimizing Operational Carbon within Whole Life Carbon for New Construction

Room: Studio B

Chair: Jamy Bacchus, PE, Full Member, ME Engineers, Denver, CO

This session will review the operational carbon from (B6) energy usage emissions along with (B7) water and wastewater emissions and (B1) refrigerant leakage (C1) end-of-life leakage with respect to the building's (A1-A5) construction related emissions for a 28-yr study period. We will present the results for office and multi-family buildings in five different climate zones to review what strategies led to the lowest operational GHG emissions. We will tally the GHG emissions per ASHRAE Standard 240P (using EN 15978 nomenclature) and review the carbon offsets in order to achieve net zero carbon per ASHRAE Standard 228.

### 1. Optimizing Buildings for Zero Carbon Lifetime Operations

Jamy Bacchus, PE, BEMP, Full Member<sup>1</sup>, Caitlin Erin Anderson, P.E., Associate<sup>2</sup> and Sedighehsadat Mirianhosseinabadi, Ph.D., Associate<sup>3</sup>, (1)ME Engineers, Denver, CO, (2)ME Engineers, Boulder, CO, (3)ME-Engineers, Eureka, MO

9:10 AM - 10:10 AM

### Seminar 9 (Intermediate)

## Moving Faster to Net-Zero and Building Decarbonization Utilizing Automated Emissions Reduction

Room: Studio E

Sponsor: 2.5 Global Climate Change

Chair: Josh Mullen, BrainBox AI, Montreal, QC, Canada

As renewable energy generation accelerates, the grid cannot always accept renewable generated power so wind or solar is curtailed. Knowing when these periods of wasted clean energy happen enables a powerful new tool to deploy for building decarbonization: timing. Timing a building's energy usage to consume more during periods when renewables would otherwise be wasted and reducing usage during periods when fossil fuels are generating, overall emissions are reduced while keeping energy use largely the same. Wasting less renewable energy creates favorable market conditions for new solar and wind to be built, further accelerating the transition to net-zero.

### 1. Moving Faster to Net-Zero and Building Decarbonization Utilizing Automated Emissions Reduction

*Geoffrey J Hancock, Full Member<sup>1</sup> and Josh Mullen<sup>2</sup>, (1)WattTime, Oakland, CA, (2)BrainBox AI, Montreal, QC, Canada*

Thursday, October 26, 10:30 AM - 12:00 PM

**Panel 12 (Intermediate)**

**Real Estate Strategies to Achieve Low Carbon Operations**

*Room: Studio D*

*Chair: Marta Schantz, LEED GA, Fitwel Ambassador, Urban Land Institute, Washington, DC*

*Panelists: Elena Alschuler, LaSalle Investment Management, Washington, DC, Summer Haltli, FCP, Washington, DC and Eric Tilden, PE, LEED AP, Elme Communities, Washington, DC*

We all know it's critical to decarbonize commercial buildings operations as the industry works to reduce emissions in line with the Paris Agreement. How is real estate doing it? What strategies are they using to reduce carbon operations in existing buildings, and how are they making it pencil financially? Energy efficiency, renewable energy, grid interactivity, electrification... join speakers as they walk through their firms' asset-level and portfolio-level strategies – as well as the business case for them - to decarbonize toward net zero.

10:30 AM - 12:00 PM

**Panel 13 (Intermediate)**

**Tackling Carbon: Ways to Reduce Operational and Embodied Carbon for your Building and Site from Design through Post-Occupancy**

*Room: Studio B*

*Chair: Amy Pastor, PE, CxA, LEED AP, ENV SP<sup>1</sup>*

*Panelists: Tom Hoepf, FALA<sup>1</sup>, Lindsey Landwehr-Fasules, LEED AP, WELL AP, SITES AP<sup>2</sup> and Curt Wade, CEM, BEP, PMP, LEED AP<sup>3</sup>, (1)EXP, Maitland, FL, United States(2)Turner Construction Company(3)University of Notre Dame*

Decarbonization of our buildings and sites is important in our industry and for the world. This session will explore opportunities to reduce and eliminate operational and embodied carbon for your building and associated site through best practices and practical approaches for architecture, engineering, design, construction and operations. From integrated design processes, use of all-electric technologies, lower carbon options for structures and paving materials (i.e. parking lots, landscape materials) and reducing emissions during construction, the panel will discuss how a collaborative team effort can create a ZERO building – today and for tomorrow.

10:30 AM - 12:00 PM

**Seminar 10 (Intermediate)**

**So, How Are We Going to Decarbonize the Whole Federal Building Portfolio?**

*Room: Salon 4*

*Chair: Ken Sandler, PhD, GSA, Washington, DC*

The White House has set ambitious greenhouse gas (GHG) reduction goals, notably to cut federal building GHG emissions to net zero by 2045. The General Services Administration (GSA) is beginning to tackle the challenge of how to bring 185 million square feet of space in 1670 owned assets to carbon neutrality. Among the issues to confront: how to prioritize existing buildings for energy retrofits; how to identify and apply the best clean energy & electrification technologies and practices; and how to fund these investments. This session will include illustrative case studies while describing the larger strategy GSA is pursuing.

**The Federal Building Decarbonization Moonshot**

*Ken Sandler, PhD, GSA, New York, NY*

**1. GSA Case Study on Decarbonization**

*John Anthony Kliem, PE, CE<, Johnson Controls, Inc., Fairfax Station, VA*

**2. GSA Strategic Outcomes**

*Tyler Harris, GSA, Washington, DC*

10:30 AM - 12:00 PM

**Seminar 11 (Intermediate)**

**Unique Methods to Minimize Operational Carbon**

*Room: Studio E*

*Chair: Ghina Annan, Stantec, Calgary, AB, Canada*



There are many strategies to reducing your carbon impact through the operation of the facility and systems, and this session covers some unique concepts that can be applied to your facility and projects. Understanding how potential incentives, such as the Inflation Reduction Act (IRA) can be applied to change some financial hurdles, it is crucial to understand and evaluate different energy contracts and how those can be utilized to increase cost savings and return for facility improvement measures. This session also covers the impact of cold climate on a campus and its path to carbon neutrality.

**1. The Coming Age of a Smart Grid and Smart Buildings**

*Thomas M Lawrence, PhD, LEED-AP P.E. Ph.D., Fellow S-B-a Member, University of Georgia, Athens, GA*

**2. Decarbonization Considerations for Different Building and Campus Typologies. How Does Resiliency Change across Federal, Healthcare, Higher Education and Corporate Settings**

*Jason Masters, Buro Happold, New York, NY*

**3. The Path to Decarbonizing Campuses in Cold Climates**

*Ghina Annan, Stantec, Ottawa, ON, Canada*

**4. Decarb Retrofits: The Role of O&M Programs**

*Charles Jelen, Associate, Trane Technologies, La Crosse, WI*

Thursday, October 26, 1:40 PM - 3:10 PM

**Panel 14 (Intermediate)**

**Leading by Example: Let's Examine Several Case Studies that Emphasize Decarbonization at Scale and Discuss How USGBC is Prioritizing Decarbonization in the Next Version of LEED**

*Room: Studio B*

*Chair: Melissa Baker*

*Panelists: Corey Enck, Wes Sullens and Laurie Kerr, U.S. Green Building Council, Washington, DC*

With decarbonization of the built environment being at the forefront of sustainability, identifying opportunities for intervention to reduce carbon emissions are vital to increasing the scale of impact. In this panel, the participants will evaluate the opportunities and challenges of addressing holistic carbon throughout a building's lifecycle. They will explain strategies for reducing carbon from the perspective of materials, electrification, and energy efficiency; will analyze two case studies of decarbonization principles being applied in an new construction and existing building LEED project; and will discuss the updates coming in LEED v5, relating to decarbonization within the EA and MR categories.

1:40 PM - 3:10 PM

**Seminar 12 (Intermediate)**

**Building Integrated Strategies for Grid Decarbonization and Net Zero Operations**

*Room: Studio E*

**Sponsor: TFBD EXCOM**

*Chair: Stet Allen Sanborn, AIA, Full Member, Smithgroup, Washington, DC*

Achieving low-carbon operations ultimately requires designing building and infrastructure systems with a changing power-grid mix in mind, creating a transitional foundation for full-scale decarbonization. This session will explore the critical links between building-scale, district-scale and grid-scale energy systems focusing on heat pump efficiencies, air versus water heating and cooling, and why sewage and geothermal heat exchange are so critical to decarbonization. The presenters will evaluate integrated strategies for grid-responsive design that improve operational performance while anticipating and bolstering larger grid decarbonization efforts.

**1. Building Integrated Strategies for Grid Decarbonization and Net Zero Operations**

*Stet Allen Sanborn, AIA, Full Member, Smithgroup, Washington, DC*

**2. Planning for the Decarbonization of the Grid**

*Katrina Kelly-Pitou, Dr., Smithgroup, Washington, DC*

**3. Cold Climate Implications for Grid Decarbonization and Net Zero Operations**

*Nancy W Kohout, Professional Engineer, Full Member, Smithgroup, Washington, DC*

1:40 PM - 3:10 PM

**Seminar 13 (Intermediate)**

**Decarbonizing Existing Tall Buildings in Cold Climates**

*Room: Salon 4*

**Sponsor: Task Force on Building Decarbonization**

*Chair: Adam W Hinge, PE, Fellow Member, Sustainable Energy Partnerships, Tarrytown, NY*

This seminar will summarize the challenges in decarbonizing tall buildings in cold climates, and present information about some successful strategies and technical solutions to cost-effectively retrofit low carbon solutions to heating and hot water in existing buildings. The session will highlight several case studies of phased deep decarbonization in very large buildings, where the building owners and their engineering teams have demonstrated successful projects, aided with significant technical assistance support and competitive project as part of a New York Statewide Building Challenge.

**1. The Empire Building Challenge**

*Sophie Cardona, New York State Energy Research & Development Authority, New York, NY*

**2. Decarbonizing Thermal Loads in Tall Office Buildings**

*Molly Ramasamy, P.E., JB&B, New York, NY*

**3. Converting Tall Multifamily Buildings from Fossil-Based Heating and Hot Water**

*Marc Marc Zuluaga Zuluaga, P.E., Cadence OneFive, New York, NY*

**4. Owner's Perspective on Tall Building Decarbonization**

*Benjamin Rodney, PE, Full Member, Hines, New York, NY*

1:40 PM - 3:10 PM

**Seminar 14 (Intermediate)**

**Designing through Regulations to Achieve Low Carbon Buildings**

*Room: Studio D*

*Chair: Bing Liu, PE, Fellow Member, Pacific Northwest National Laboratory, Portland, OR*

This session covers innovative strategies to meet the zero-energy codes by the end of the decade and its impact on owners, designers, and facility staff. Designers and manufactures need to work together to better understand the impact of equipment performance on whole life carbon and the potential for performance maps all types of equipment to improve control strategies in operation. This session also discusses the combination of heat pumps with thermal storage, and their impact on the bottom line as well as ways for these facilities to work through the regulations and energy codes to deliver a low carbon building.

**1. Strategies to Lead the Buildings to the Zero Energy Path**

*Bing Liu, PE, Fellow Member, Pacific Northwest National Laboratory, Portland, OR*

**2. The Future of Equipment Energy Efficiency Metrics**

*Mark W Fly, PE, Fellow Life Member, AAON, Inc., Merritt Island, FL, United States*

**3. Decarbonization, Heat Pumps and Thermal Energy Storage**

*Mark M MacCracken, PE, Life Member, Trane Technologies, Miami, FL*

**4. Decarbonizing Data Centers through Performative Building Enclosure Design**

*Thomas Zakrzewski, Principal, Director of Building Engineering Physics, BEMP, Associate, HKS, Inc., Chicago, IL*

Thursday, October 26, 3:30 PM - 5:00 PM

**Panel 15 (Intermediate)**

**Developing and Enacting an Effective Decarbonization Plan in Healthcare**

*Room: Studio D*

*Chair: Christine Foster, ECRI<sup>1</sup>*

*Panelists: Christina Sanborn<sup>2</sup> and Alex Podolsky<sup>3</sup>, (1)Stanford Children's Health | Lucile Packard Children's Hospital, San Jose, CA(2)Mazzetti, San Francisco, CA(3)Ameresco, Lafayette, CA*

Healthcare has a special responsibility to decarbonize as climate change continues to put pressure on public health worldwide. The health sector represents 8% of US emissions and health damages from US Healthcare pollution are equal to deaths from preventable medical errors. In recognition of these impacts, the industry is embracing change. Stanford Medicine Children's Health undertook a strategic decarbonization plan in 2021 and began implementation in 2022. Hear how this forward-thinking institution and key partners organized its stakeholders to develop its plan, decided to make public commitments, evaluated implementation and funding options, and is now moving forward with decisive action.

3:30 PM - 5:00 PM

**Panel 16 (Intermediate)**

**Retail Decarbonization at Scale: Methodology & Lessons Learned**

*Room: Studio B*

**Sponsor: 2.8 Building Environmental Impacts and Sustainability, 7.6 Building Energy Performance**

*Chair: Benjamin Berger, Executive Director | Global Major Projects Governance & Oversight<sup>1</sup>*

*Panelists: George Miroshnikov, CEM, LFA, LEED AP BD+C, WELL AP, CPHD, BEMP<sup>2</sup>, Navid Pourmousavian, BEMP, Student<sup>3</sup> and James Cava, Executive Director Retail Design & Construction<sup>1</sup>, (1)JP Morgan Chase & Co., Tampa, FL(2)Jones Lang LaSalle, New York, NY(3)JLL Canada, Toronto, ON, Canada*

To drive the transition towards carbon neutrality, the development of scalable frameworks is critical. Together, JPMC and JLL have created a technical framework that identifies optimized building designs for achieving zero carbon in retail sites across the US. The panelists will provide insights into the prototyping and optimization approaches, as well as the strategies that have successfully achieved carbon savings in the field. Attendees will gain valuable knowledge on the development of the framework and the potential barriers to its adoption. Furthermore, the session will explore the lessons learned on cost, schedule, and performance impacts.

3:30 PM - 5:00 PM

### Seminar 15 (Advanced)

## Facade-Integrated Mechanical Systems for Multifamily Decarbonization Retrofits in Cold Climates

*Room: Salon 4*

*Chair: David J Goldstein, Professional Engineer, Full Member, Hydronic Shell Technologies, Long Island City, NY*

This seminar introduces facade-integrated mechanical systems (FIMS) as a new approach for decarbonizing existing multifamily buildings in cold climates, providing full space conditioning and balanced ventilation. FIMS are installed over the existing building facade from the exterior, allowing tenants to remain in place with minimal disruption. The first presentation will give a technical and economic overview of the FIMS concept, including how it addresses the major challenges associated with decarbonizing large multifamily buildings, including suitable applications. The second presentation will share data and insights from initial lab testing of FIMS performance, as well as the future path for FIMS R&D.

### 1. An Overview of Façade-Integrated Mechanical Systems for Multifamily Decarbonization Retrofits in Cold Climates

*David J Goldstein, Professional Engineer, Full Member, Hydronic Shell Technologies, Long Island City, NY*

### 2. Results from Laboratory Validation Testing of Facade Integrated Mechanical Systems

*Jason J LaFleur, Full Member, Gas Technology Institute, Des Plaines, IL*

3:30 PM - 5:00 PM

### Seminar 16 (Intermediate)

## Tales from the South: Accelerating Resilience in the Vulnerable and Challenging Southeast U.S. Market

*Room: Studio E*

*Chair: Bill Bradford, Principal-Energy, Sustainability & Resiliency, Hanson Professional Services Inc., Maitland, FL*

Designing net-zero buildings and implementing renewable energy projects is part of a holistic decarbonization plan. With impressive new decarbonization commitments from building sectors across local government, the private sector, and real estate investors, there is a long tail of low performance in the 75th percentile across large and aging portfolios of buildings. Amongst various climate vulnerabilities and policy challenges across the southeast U.S., collaboration, commitment, and action helped achieve decarbonization goals for large building portfolios and communities. This session will provide attendees with lessons learned and new tools from speakers recognized for their real-world efficiency, resilience, and decarbonization goal achievements.

### 1. Tales from the South: Accelerating Resilience in the Vulnerable and Challenging Southeast U.S. Market

*Bill Bradford, Principal-Energy, Sustainability & Resiliency<sup>1</sup>, Jeff Benavides, Director of City and Building Performance, Associate<sup>2</sup>, Carrie Black, Chief Sustainability & Resilience Officer<sup>3</sup> and Erik Schmidt, Director of Sustainability<sup>4</sup>, (1)Hanson Professional Services Inc., Heathrow, FL, (2)L.E. Rigby Consulting, Washington, DC, (3)Orange County, FL Government, Orlando, FL, (4)City of Chattanooga, Chattanooga, TN*

**Friday, October 27**

Friday, October 27, 8:10 AM - 9:00 AM

### Keynote (Intermediate)

## Sue Hall Climate Neutral Business Network

*Room: Salon 4*

Beyond the built environment, why and how are decarbonization efforts mainstreaming in other sectors? Spanning corporate, financial market and governmental policy innovations, commitments to decarbonize have deepened across all sectors of the economy – not just in the US but globally. We will explore some of the leading forces restructuring such diverse markets towards a low carbon future, examine why they are gaining traction -- and ask how such trends could benefit decarbonization efforts in the built environment.

Friday, October 27, 9:10 AM - 10:10 AM

### Panel 17 (Intermediate)

#### **De-Carbonization at Boston University: Vision, Design, Construction and Operation!**

*Room: Studio D*

*Chair: Ari Tinkoff, Principal, Member<sup>1</sup>*

*Panelists: Joshua D Michaud, Associate Principal, Associate<sup>2</sup>, Dennis Carlberg, Associate Vice President for University Sustainability at Boston University<sup>3</sup> and Dan Quigley, Director, Engineering & Building Systems at Boston University<sup>3</sup>, (1)BR+A Consulting Engineers, Washington DC, VA(2)BR&A Consulting Engineering, Boston, MA(3)Boston University, Boston, MA*

As a model for other organizations, we will describe one of the deepest ground-source heat pump-chiller system installation that unlocked fossil fuel free design for the new Center for Computing and Data Sciences building at Boston University. The vision of senior leadership, design process, challenges and operational considerations will be reviewed.

9:10 AM - 10:10 AM

### Seminar 17 (Basic)

#### **Building a Carbon-Free Future: Unlocking the Potential of Existing Buildings**

*Room: Salon 4*

**Sponsor: 7.1 Integrated Building Design**

*Chair: Marianna Vallejo, Full Member, Jacobs, Arlington, TX*

The seminar focuses on the urgent need for decarbonization of existing buildings, which contribute significantly to greenhouse gas emissions. The seminar explores various strategies and technologies that can be employed to reduce the carbon footprint of existing buildings, including energy-efficient retrofits, renewable energy sources, and sustainable building materials. The seminar features presentations from experts in the field of green building design, energy efficiency and sustainable technology, who will share their insights and experiences on successful decarbonization projects. The seminar also includes case studies of real-world projects, highlighting the challenges and opportunities of decarbonizing existing buildings.

**1. Preserving the Past, Building for the Future: The Montreal City Hall Zero Fossil-Fuel Retrofit**

*Lianne Cockerton, P. Eng., Full Member, Martin Roy et Associes, Deux-Montagnes, QC, Canada*

**2. The Phenix: A Zero-Carbon Living Laboratory for Sustainable Design in an Existing Building**

*Martin Roy, P.Eng, Leed Fellow, Full Member, Martin Roy et Associes, Deux-Montagnes, QC, Canada*

**3. Transforming Existing Buildings to Zero Carbon Design: The Uap Head Office**

*Oscar Hernandez, PhD, Full Member, Lemay, Montreal, QC, Canada*

9:10 AM - 10:10 AM

### Seminar 18 (Intermediate)

#### **Deep Green, Market Rate, Net Zero: How ASHRAE's New Global Headquarters Renovation Achieved All Three**

*Room: Studio B*

*Chair: Stanton Stafford, PE, LEED Fellow, Member, Buro Happold, Atlanta, GA*

As the global stock of buildings constructed prior to 1980 approaches a half century of use, design professionals will increasingly be asked to transform these structures via high performance, deep green renovations. To help minimize embodied and operational carbon impact, these renovations will need to achieve higher levels of sustained, demonstrated performance. The recently completed renovation of a 1970's suburban office building into a net-zero headquarters for ASHRAE provides a timely case study into how the right strategies can lead to better outcomes. The operational challenges of achieving net Zero outcomes are explored, with examples of some strategies.

**1. ASHRAE Headquarters Building: The Journey to Net Zero**

*Darryl Boyce, Carleton University, Kemptville, Canada*

**2. Deep Green, Market Rate, Net Zero: How ASHRAE's New Global Headquarters Renovation Achieved All Three.**

*Gregory Walker, AIA, NCARB, LEED AP, Houser Walker Architecture, Atlanta, GA*

9:10 AM - 10:10 AM

**Seminar 19 (Basic)**

**Dollars and Decarbonization**

*Room: Studio E*

*Chair: Jared Langenfeld, Associate, Member, Smith and Boucher, Olathe, KS*

Often when someone mentions sustainable buzz words such as decarbonization, owners just see dollar signs. But is that necessarily the case? Does decreasing energy use always have a first cost associated with it? Are there cost effective low embodied carbon materials? Could there be more benefits to decarbonization beyond lower utility bills? Join Jared Langenfeld and Ashley Eusey as they tackle these questions with data and real world examples on possibilities and pragmatic applications for lowering your carbon footprint. Along with strategies, the team will also give tips for making these conversations with clients more palatable.

**1. Dollars and Decarbonization**

*Ashley Eusey, Director of Sustainability, Hoefler Welker, Leawood, KS*

Friday, October 27, 10:30 AM - 12:00 PM

**Seminar 20 (Intermediate)**

**Decarbonization Driver: A New Hybrid Ventilation Method to Achieve High IAQ, Low Energy, Climate Resilient Buildings**

*Room: Studio B*

*Chair: Marwa Zaatari, PhD, Associate, D Zine Partners, Austin, TX*

This session introduces a new approach to hybrid ventilation to achieve low carbon building operations. The new approach is based on an expanded definition of hybrid ventilation systems that includes air cleaning in addition to ventilation (natural and mechanical). This new approach is supported by recent updates to the IAQ Procedure in ASHRAE 62.1 and builds on lessons learned from the COVID-19 pandemic regarding layered strategies and equivalent air changes. The presentations focus on updates to Standards and the carbon impact of applying hybrid ventilation with air cleaning in a modeling study and three case studies.

**1. Hybrid Ventilation Approach: Introduction and Standards Update**

*Marwa Zaatari, PhD, Associate, D Zine Partners, Austin, TX*

**2. Assess and Implement Hybrid Ventilation System in an Office Building to Achieve a Low Carbon Building**

*Brandon J Harwick, PE, LEED AP, Full Member, Engenium Group*

**3. Ventilation Strategies to Achieve Low Carbon Operations: Harvard University Campus Case Study**

*David H Ellowitz, PE, HBDP, Full Member, AHA Consulting Engineers, Inc., Boston, MA*

**4. Hybrid Ventilation Strategy Implemented Early in Design Process to Achieve Cost/Carbon Savings and Enhanced IAQ**

*William Fuchs, PE, LEED AP, Associate, CMTA, Prospect, KY*

10:30 AM - 12:00 PM

**Seminar 21 (Intermediate)**

**Decarbonization Tales: Old, New and Historic!!!**

*Room: Salon 4*

*Chair: Kent W Peterson, PE, Presidential Fellow Member, P2S Inc, Long Beach, CA*

The existing building stock must be improved for many reasons; IEQ, energy, failed equipment, and especially carbon neutrality. This session includes three separate case studies that provide details on how old and new, and even historic buildings were

renovated to not only reduce the carbon footprint but to improve the overall comfort and IEQ for dated buildings and systems. They will discuss a switch in heating hot water strategies, using combined heat and cooling systems, geothermal systems, and expand beyond the HVAC into lighting strategies, insulation, and renewables. Learn the successes and avoid the pitfalls from these decarbonization tales.

**1. Hhw System Decarbonization Retrofits: Opportunities and Constraints**

*Kevin James Ricart, PE, Associate and Urwa Irfan, Associate, SmithGroup, Chicago, IL*

**2. Lessons from Decarbonization Retrofits**

*Kent W Peterson, PE, Presidential Fellow Member, P2S Inc, Long Beach, CA*

**3. Fusing Historic Preservation with 21st Century Design Innovation: The Edsel and Eleanor Ford House Visitor Center and Administration Building**

*Brittany K Fiema, PE, LEED Green Associate, Detroit ASHRAE Chapter President, Full Member, SmithGroup, Detroit, MI*

10:30 AM - 12:00 PM

**Seminar 22 (Intermediate)**

**Investing in Decarbonization! Getting in on the 'Radiant Floor'**

*Room: Studio D*

**Sponsor: 6.5 Radiant Heating and Cooling, Young Engineers in ASHRAE**

*Chair: Elizabeth Jedrlinic, Full Member, Trane, New York City, NY*

Radiant floor heating and cooling systems can play a critical role in the effort to decarbonize construction, while ensuring comfortable, healthy indoor environments. Join this session to explore the key design considerations, strategies, and benefits of these systems, along with an honest discussion of the challenges that lead architects and builders to remove them. By combining theoretical energy simulations with lessons learned from real-life case studies of low carbon operations, we'll demonstrate how radiant systems are poised to play an important role in the future of decarbonization.

**1. Radiant Floors: Decarbonization Using Building Simulation**

*Brett Banadyga, P.Eng., LEED Green Associate, Associate, The AME Consulting Group Ltd., Calgary, AB, Canada*

**2. De-Value Engineering of Radiant Floors**

*Ryan W Johnson, P.Eng., Associate, MacPherson Engineering, SK, Canada*

**3. The Learning Curve of Operating Radiant Floor Buildings**

*Christopher Sawicki, CEFP, Member, University of Regina, Regina, SK, Canada*

10:30 AM - 12:00 PM

**Seminar 23 (Intermediate)**

**Show Me the Money...to Successfully Decarbonize the Built Environment**

*Room: Studio E*

*Chair: Nora Wang Efram, American Council for an Energy-Efficient Economy, Washington, DC*

Project financing can always get creative, and it has been doing that for a very long time to reduce energy consumption. This session covers existing building models and financing arrangements to be able to scale comprehensive retrofit projects toward building electrification that can take advantage of programs and incentives. In addition, two case studies that revolve around the different financing models to achieve the greenhouse gas emissions targeted. Another financial strategy, through on-bill financing is evaluated by modelling for a representative of 50,000 dwellings to find how to apply this process across affluent and disadvantaged communities.

**1. Reach Decarbonization Projects with Long Payback Periods**

*Nora Wang Efram, American Council for an Energy-Efficient Economy, Washington, DC*

**2. Equitable Decarbonization: Leveraging Utility Bills for Residential Building Upgrades**

*Katelyn Stenger<sup>1</sup>, Thomas Bowen<sup>2</sup>, Janet Reyna<sup>1</sup>, Lixi Liu, PhD<sup>1</sup>, Anthony Fontanini, Ph.D., Full Member<sup>1</sup>, Noah Sandoval<sup>1</sup> and Christina Simeone<sup>2</sup>, (1)National Renewable Energy Laboratory, Golden, CO, (2)National Renewable Energy Laboratory, Washington, DC*

**3. Supercharging Decarbonization through Innovative Financing Structures**

*Saad Rashid, P.Eng., Mott MacDonald, Toronto, ON, Canada*