

2025 ASHRAE Building Decarbonization Conference

October 22-24, 2025 | Chicago, IL

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Wednesday, October 22

Wednesday, October 22, 8:30 AM - 9:30 AM

Keynote (Intermediate)

Brendan Owens, Black Vest Strategy, Alexandria, VA The Building Industry's Role in Achieving Energy Dominance and Security

Room: Grand Ballroom

How can our buildings become engines of resilience, opportunity, and support national security? Former Assistant Secretary of Defense Brendan Owens explores how strategically aligned policy and planning enhance national security and make buildings central to the clean energy transition. He also discusses how decarbonization of infrastructure and buildings bolsters energy security and shapes a more equitable and resilient future.

Wednesday, October 22, 9:40 AM - 10:40 AM Panel (Intermediate)

From Vision to Reality: Overcoming Institutional Barriers in Campus Decarbonization

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Promenade Ballroom

Chair: Hardik Miyani, PE, CEM, CRE, CPHC, LEED GA, Associate Member¹, Brandon Pieczynski, CEM, Associate Member¹, Peter Garforth² and Nicholas Paseiro, CEM, LEED AP BD+C, LEED AP O+M, WELL AP³, (1)Baumann Consulting, Chicago, IL(2)Garforth International, LLC, Toledo, OH(3)Henry Ford College, Dearborn, MI

Scaling campus decarbonization requires a holistic approach that integrates environmental, economic, technical and educational goals. This session explores the successful decarbonization journey of Henry Ford College (HFC) and the broader implications for universities and communities seeking similar transformations. Panelists discuss the decision-making and governance processes that enabled systemic change, the role of institutional leadership and the integration of planning tools, to track progress. The role of simulating "whole college" scenarios to assess multiple technical and economic configurations to guide final investment decisions are discussed. However, rather than focusing on the technical aspects of decarbonization, this session highlights the coordination, financing and stakeholder engagement that are critical for success. Key insights from the implementation of the Integrated Energy Master Plan (IEMP) are shared, along with lessons learned on overcoming institutional and operational barriers. The discussion also emphasizes the "living classroom" concept, fostering mentorship and workforce development to sustain long-term energy transitions. Attendees gain a deeper understanding of how to replicate these strategies across campuses and communities.

9:40 AM - 10:40 AM

Panel (Intermediate)

Making Building Performance Standards Strategic: New Efforts to Align BPS Policies for Deep Decarbonization

Track: Blueprints for Change: Policies, Standards and Programs

Room: Riverfront Room

Chair: Katie Kaluzny, Illinois Green Alliance, Connor Jansen, PE, Full Member, Slipstream, Marshall Douglas Duer-Balkind, Institute for Market Transformation, Washington, DC and Katie Schwamb, Building Energy Exchange, New York, NY State and local governments are increasingly requiring decarbonization of existing buildings through Building Performance Standards (BPS). But are these new policies and codes really driving strategic approaches to decarbonization? What can be done to standardize the confusing (and sometimes conflicting) mix of requirements across different jurisdictions? What technical and financial approaches are working in buildings, and how can ASHRAE resources help? This session addresses these important questions by exploring a new cross-sector project to standardize BPS alternative compliance pathways and improve training resources. Panelists draw on hands-on experience implementing BPS policies, developing training programs and developing building decarbonization projects as they reflect on lessons learned and highlight future opportunities.

9:40 AM - 10:40 AM

Seminar (Basic)

Decarbonization Demystified: A Guide for Emerging Professionals

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Grand Ballroom

Chair: Nancy W Kohout, Professional Engineer, Full Member, Danielle Passaglia, Mechanical Engineer and Eva Koester, SmithGroup, Chicago, IL

Are you new (or new-ish) to building decarbonization? Do you have lingering questions about decarbonization? This is the session for you. Fundamental concepts and common terminology used in building decarbonization are introduced, and key drivers are identified. A range of topics are discussed, including strategies such as envelope optimization, heat pump technology, control optimization and more. Specific applied examples are shared to help make content relatable.

1.Building Decarb 101, Part 1: The What and Why of Decarbonization

Danielle Passaglia, Mechanical Engineer, SmithGroup, Chicago, IL

2.Building Decarb 101, Part 2: The How of Decarbonization Nancy W Kohout, Professional Engineer, Full Member, SmithGroup, Chicago, IL

Wednesday, October 22, 10:30 AM - 12:00 PM

Seminar (Intermediate)

Completed HIgh Rise Electrification Projects in NYC: Lessons Learned in Design, Construction, Commissioning and Occupancy

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Astor Room

Chair: Clayton Brancato, PE, Associate Member¹, Michelle M DeCarlo, PE, LEED AP BD+C¹, Maxwell Hatfield-Biondo, PE, LEED AP BD+C¹ and Daniel H Nall, PE FAIA FASHRAE CPHC, Fellow Life Member², (1)JBB Consulting Engineers, New York, NY(2)Daniel Nall, Consultant, LLC, Princeton, NJ

Since the advent of New York City Local Law 97, limiting carbon emissions in buildings, electrification projects have proliferated in New York City. This seminar highlights the completed electrification projects in three different buildings with different strategies, different constraints and different lessons learned. Electrification of space heating and domestic hot water in New York City, both for new buildings and retrofits, is motivated by the new Local Law 97 which established carbon emissions limits for buildings and imposed fines for buildings that exceed those limits. The three completed buildings include a new building for a media company with broadcast studios. This building is a "first generation" strategy that has higher heating water temperature and no thermal storage. The second building, also new, is a "second generation" building that has a reduced heating water temperature and geo-exchange storage and the third retrofit building uses ice -making for source-side thermal storage. Each of these buildings have issues that arose during the stages of design through occupancy. Some of the lessons from these projects are specific to the individual projects, while others are more universal and have informed electrification projects that have followed. We have learned a lot from these projects.

1.Why Electrification and Why New York City: The Impact of Local Law 97 and Lessons Learned from Electrification Projects in New York City

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

2.Media Company Headquarters in Hudson Square

Maxwell Hatfield-Biondo, PE, LEED AP BD+C, JBB Consulting Engineers, New York, NY 3.555 Greenwich: Extreme Carbon Reduction Using State of the Art Strategies Michelle M DeCarlo, PE, LEED AP BD+C, JBB Consulting Engineers, New York, NY 4.55 Water Street: Using Active Heat Recovery and Ice Heating to Reduce Carbon Emissions Clayton Brancato, PE, Associate Member, JB&B, New York, NY

Wednesday, October 22, 11:00 AM - 12:30 PM Panel (Intermediate)

Small State, Big Flex(ible) Loads! Vermont's Collaboration for Scalable, Grid Adaptive, Hybrid Heating in Commercial and Industrial Spaces

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Promenade Ballroom

Chair: Michael Gifford, Associate¹, Michael Gifford, Associate¹, Mary Jane Poynter, Member², Morgan Casella³ and Cyril Brunner⁴, (1)Vermont Gas Systems, South Burlington, VT(2)Efficiency Vermont, Winooski, VT(3)Dynamic Organics, Putney, VT(4)Vermont Electric Cooperative, Johnson, VT

Decarbonizing thermal end uses in cold climates presents significant challenges, particularly for commercial and industrial customers. Vermont's utilities and energy partners are pioneering innovative, market-ready hybrid heating solutions that optimize real-time carbon emissions, demand flexibility and cost savings. This panel explores Vermont's collective efforts to integrate electric and gas utilities with efficiency programs to drive impactful decarbonization. Case studies highlight successful hybrid heating projects, including a dispatchable electric boiler, considerations for industrial heat pumps and emerging explorations of heat recovery heat pump systems in small and medium-sized businesses. Panelists address market barriers to hybrid rooftop units and discuss strategies for accelerating adoption. A key theme will be flexible load management, demonstrating how utilities can use price signals, real-time carbon intensity and grid-responsive technologies to optimize thermal load shifting. Attendees gain insight into Vermont's collaborative approach and how utilities and industry partners can scale similar programs and grid-integrated building electrification. By weaving together policy, pragmatism and technological innovation, this panel showcases scalable solutions that advance both economic and environmental goals.

11:00 AM - 12:30 PM

Seminar (Intermediate)

Building Resilient and Net-Zero Hospitals for the Future: A Spotlight on the Cowichan District Hospital Replacement Project / Energy Resilience for Electrified Critical Facilities

Track: Beyond Decarbonization: Flattening Utility Demand, Considering Resilience and More Room: Riverfront Room

Koom: Riverjroni Room

Chair: Walt Vernon IV, P.E., Member, Mazzetti, San Francisco, CA

The Cowichan District Hospital Replacement Project redefines healthcare design by prioritizing top-quality care with sustainability, resiliency and cultural inclusivity. As Canada's first hospital on track to achieve CaGBC Zero Carbon Building Design Standard and British Columbia's first fully electric hospital, it sets a precedent for integrating environmental and social stewardship. Delivered through an alliance procurement model, the project aligns energy and sustainability goals with patient-centered healing environments, safety and Indigenous representation. This seminar explores how innovative engineering solutions, energy-efficient systems and collaborative project delivery methods address resiliency, pandemic preparedness and designing for a changing climate.

1. Energy Resilience for Electrified Critical Facilities

Walter N Vernon, Professional Engineer, Full Member¹ and David Bliss, MD², (1)Mazzetti, (2)Farraday Microgrids, Irvine, CA

2.Building Resilient and Net-Zero Hospitals for the Future: A Spotlight on the Cowichan District Hospital Replacement Project

Meagan Webb, P.Eng., Associate¹, Nicholas Stark, P.Eng., CED, LEED AP®, ICD.D, Member¹, Ryan Kennedy, P.Eng., LEED AP® BD+C¹ and Kyle Basilius, AIA, ACHA, EDAC, NCARB², (1)H.H. Angus & Associates Limited, Vancouver, BC, Canada, (2)Parkin Architects, Vancouver, BC, Canada

Wednesday, October 22, 2:10 PM - 3:40 PM Panel (Intermediate)

Electrifying Heat in an Existing Hospital

Track: Beyond Decarbonization: Flattening Utility Demand, Considering Resilience and More Room: Riverfront Room

Chair: Fiona Martin McCarthy, P.E., Full Member, Grumman/Butkus Associates, EVANSTON, IL

Electrifying an existing hospital heating systems is considered one of the most significant challenges to decarbonizing health care operations. The American Society for Health Care Engineering, the Washington State Society for Healthcare Engineering and Providence Health funded NeuMod Labs to determine the feasibility of decarbonizing scope 1 emissions at an already energy efficient existing hospital in Olympia, WA. Published in December 2024, the team explored all the drivers of heating energy and load including envelope, HVAC and process loads, examined the steam and hot water distribution system and finally explored approaches to electrify the heating system all while pursuing beneficial electrification. Leveraging operational data augmented by a calibrated energy model, and additional field collected data, the study explores four different pathways towards an electrified heating system. Each pathway included construction phasing considerations to maintain hospital operations and cost estimating.

2:10 PM - 3:40 PM

Seminar (Intermediate)

Decarbonizing the Global Cold Chain: Integrating Thermal Energy Storage, Electrified Transportation and Carbon Accounting

Track: Beyond Decarbonization: Flattening Utility Demand, Considering Resilience and More Room: Promenade Ballroom

Chair: Stan Nabozny, Director of Thermal Energy Consulting, Michaels Energy, La Crosse, WI, Robert Koelsch, CEO, AEM Green, Mesa, AZ, McGee Young, CEO, WattCarbon, San Francisco, CA and Bruce B Lindsay, PE, Life Member, Trane Technologies, Melbourne, FL

The global cold chain is a critical component of food security, food distribution and industrial logistics, yet it remains one of the most energy-intensive sectors, heavily reliant on fossil fuels. As electrification efforts accelerate, innovative strategies are needed to reduce peak electric loads, enhance grid flexibility and lower carbon emissions. Thermal energy storage (TES) is a transformative solution for refrigerated warehouses and transportation, enabling facilities to shift cooling loads to off-peak hours. By decoupling refrigeration from real-time electricity demand, TES enhances efficiency, reduces costs and strengthens grid resilience while supporting flexible demand management. Deployed in industrial cold storage, food distribution and transport refrigeration, TES provides a scalable, low-carbon pathway to decarbonizing the cold chain. Electrified transport refrigeration units (E-TRUs) for Class 8 vehicles provide scalable, emission-free alternatives to diesel-powered refrigeration. This seminar explores real-world adoption, infrastructure challenges and financial benefits. To meet climate mandates, carbon accounting frameworks must verify Scope 2 and Scope 3 emissions reductions. This session introduces a system of record integrating refrigeration, transport and energy data, ensuring transparency and ROI from ESG initiatives. This seminar presents a framework for decarbonizing the cold chain, sharing case studies and actionable strategies to support industry-wide adoption. **1.Decarbonizing the Global Cold Chain: Leveraging Thermal Energy Storage for Peak Demand Reduction and Grid Resilience**

Stan Nabozny, Director of Thermal Energy Consulting, Michaels Energy, La Crosse, WI

2. The Future of Electrified Transport Refrigeration: Reducing Diesel Dependence in Cold Chain Logistics *Robert Koelsch, CEO*, *AEM Green, Mesa, AZ*

3.Turning ESG Commitments into ROI: Carbon Accounting for Refrigeration and Logistics *McGee Young, CEO, WattCarbon, San Francisco, CA*

2:10 PM - 3:40 PM

Seminar (Advanced)

Innovating to Zero: Developer Arriving at Net Positive, Operator Electrifying a Community Including Shared EVs and Designer Outthinking AI in "Human Versus AI"

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Astor Room

Chair: Marzia Sedino, PE, Associate, SOM, Chicago, IL

This seminar features three Leading Projects in Climate Action. 1) Net-Zero on Campus at the University of Illinois at Urbana-Champaign - a developer leads the creation of a fully net-zero building powered by renewable energy and ground-source heat pumps. As a pilot project on a campus still reliant on fossil fuels, it sets the stage for broader climate action in cold-climate academic settings. 2) All-Electric, Shared Mobility in Cold Climates - one of Canada's largest building operators unveils a highperformance, net-zero building that runs entirely on electricity—even through harsh winters. The project also pioneers a shared electric vehicle system, featuring vertical carousels for space-efficient storage and accessibility. 3) Human vs. AI: Designing a Low-Carbon Future - a design team takes on the ambitious challenge of decarbonizing a large portfolio of buildings, competing directly with an AI system. Spanning structures from the 1800s to today—including labs, offices and high-traffic facilities—this "human versus machine" competition explores the future of carbon analysis and design at scale.

1.Human versus AI

Shona O Dea¹ and Luke C H Leung, PE, BEMP², (1)DLR Group, West Sacramento, CA, (2)Skidmore Owings & Merrill, Chicago, IL

2.Operating a Net Zero Eve Project

Ping Sheng HOWARD LU, Full Member, Ainsworth Inc., Toronto, ON, Canada

3.Net Zero Campus Instruction Facility, Uiuc

Chris Dillion, Canpbell Coyle, Chicago, IL

2:10 PM - 3:40 PM

Workshop (Intermediate)

Beyond Energy: A Workshop on Tackling Whole Life Carbon

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Grand Ballroom

*Chair: Wyatt Ross, Associate Member*¹, Juan Guarin² and Wyatt Ross, Associate Member¹, (1)CMTA, Cincinnati, OH(2)Perkins Eastman, Washington DC

Curious about embodied vs. operational carbon and which matters more when decarbonizing buildings? This interactive session introduces whole-building life-cycle emissions and guides participants through a hands-on design challenge. In small groups, you'll work through a mock building project, explore strategies to reduce whole-life GHG emissions and weigh trade-offs between carbon, health, wellness, capital costs and more. You'll leave with a better understanding of how to prioritize design decisions and communicate their impacts. Come ready to collaborate, think critically and engage with peers to solve real-world decarbonization challenges.

1.Beyond Energy: A Workshop on Tackling Whole Life Carbon

Wyatt Ross, Associate Member, CMTA, Cincinnati, OH

Wednesday, October 22, 4:00 PM - 5:00 PM

Seminar (Advanced)

Whole Life Carbon Studies: Using Available Standards and Resources to Understand a Building's Emissions across its Entire Life Cycle

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Astor Room

Chair: Jamy Bacchus, PE, Full Member¹, Efrie Escott, AIA, LEED AP BD+C, LCACP, LFA², Caitlin Erin Anderson, P.E., Associate³ and Jamy Bacchus, PE, Full Member¹, (1)ME Engineers, Denver, CO(2)Schneider Electric, Philadelphia, PA(3)ME Engineers, Boulder, CO

In a continuation from our prior 2020-2023 ASHRAE presentations, this new session layers on MEP embodied carbon from CIBSE TM65 NA and vary their service lives to gauge their overall impacts on whole life carbon to the DOE prototype office and multi-family buildings in five different climate zones. New Cambium hourly emissions data is applied to look at operational carbon emissions and determine the optimal strategies for emission reductions (B6). The analysis also includes (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 60-yr study period. An update on the current version of ASHRAE Standard 240 (proposed or final) is provided and compared to the previous evaluation. Finally, the speakers take a new look at marginal vs. average emissions as related to ASHRAE 189.1 LRMER tables to see the advantages and potential pitfalls of each option.

1.Recap: A Quick Review of Prior Years Work so We Can Get to the New Stuff

Jamy Bacchus, PE, BEMP, Full Member, ME Engineers, Denver, CO

2.ASHRAE 240(P)

Efrie Escott, AIA, LEED AP BD+C, LCACP, LFA, Schneider Electric, Philadelphia, PA 3.MEP 2040 and the Impact of MEP Systems Embodied Carbon

Caitlin Erin Anderson, P.E., Associate, ME Engineers, Boulder, CO

4:00 PM - 5:00 PM

Seminar (Intermediate)

Beyond the Borefield: Tackling Challenges Implementing Geo-Exchange at the University of Michigan

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation

Room: Promenade Ballroom

Chair: Brittany K Fiema, PE, LEED Green Associate, Detroit ASHRAE Chapter President, Full Member¹, Sophia B Jones, Mechanical Engineer, Associate¹, Melissa Bustamante² and Brian Noonan, Member¹, (1)SmithGroup, Detroit, MI(2)University of Michigan, Ann Arbor, MI

Going beyond the bore, this seminar addresses the challenges existing buildings face ahead of the implementation of a geoexchange system. Apart from the geo-exchange borefield, project complexities can add up when existing conditions are less than ideal, including space constraints and identifying the necessary retrofit/deferred maintenance items an existing building will need before transitioning to low temperature heating hot water. Join our speakers as they talk through the preparation, implementation and commissioning takeaways of an integrated geo-exchange system with existing campus-scale distribution.

1.Geo-Exchange Implementation Design Decisions

Brittany K Fiema, PE, LEED Green Associate, Detroit ASHRAE Chapter President, Full Member, SmithGroup, WASHINGTON, DC

2.Existing Building Preparation for Geo-Exchange System Integration Sophia B Jones, Mechanical Engineer, Associate, SmithGroup, Detroit, MI 3.Geo-Exchange Data Collection Melissa Bustamante, University of Michigan, Ann Arbor, MI

4:00 PM - 5:00 PM

Seminar (Basic)

Evaluate, Execute, Evolve: Decarbonizing a 26 Million sq. ft. Portfolio to Align with Building Performance Standards

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Riverfront Room

Chair: Jason A Majerus, P.E., Full Member¹, Coral Winona Pais, P.E., Full Member¹, Jen Croft², Erika Lehman³ and Coral Winona Pais, P.E., Full Member¹, (1)DLR Group, Cleveland, OH(2)Department of General Services, Washington, DC(3)DLR Group, Washington DC

This session provides an overview of the planning, execution and implementation of close to 200 projects across the Washington DC Department of General Services (DGS) portfolio aimed at reducing emissions by 45,000 mTCO2e. Participants gain insights on the development of the energy management plan which served as the blueprint for the energy projects implemented and compliance with BEPS. This session also examines several pathways for the execution of projects in the portfolio. Finally, a case study of a whole building retrofit of within the DGS Portfolio illustrate how it aligned with the EMP targets.

1.Drivers for Energy Planning at Different Scales

Jason A Majerus, P.E., Full Member, DLR Group, Cleveland, OH

2.Development of an Energy Management Plan

Coral Winona Pais, P.E., BEMP, Full Member, DLR Group, Cleveland, OH

3.Execution Pathways for Decarbonization of 300 Buildings

Jen Croft, Department of General Services, Washington, DC

4.Decarbonization of Projects within Energy Management Plan *Erika Lehman, DLR Group, Washington DC*

4:00 PM - 5:30 PM

Seminar (Advanced)

Decarbonization Retrofits for District Energy Systems

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Grand Ballroom

Chair: Blake E Ellis, PE¹, Kent Peterson², John Goodin³, Michelle Kiana Shadpour, PE, Full Member⁴ and Kent Peterson², (1)Burns & McDonnell, Kansas City, MO(2)P2S Inc.(3)CMTA(4)SC Engineers, Inc, San Diego, CA

This seminar explores innovative decarbonization retrofit strategies for district energy systems across various campuses and facilities. Through four engaging presentations, participants learn how to reduce carbon footprints by transitioning from steam to hot water heating, utilizing geo-exchange heat pumps and implementing solutions like thermal energy storage, solar PV and battery systems. The presentations compare large university and healthcare campuses, each facing unique challenges—from ample greenspaces to compact urban areas—and highlight the financial, operational and environmental impacts of moving toward net-zero solutions. Discover how a California college is transitioning to an all-electric central utility plant, learn how a major U.S. city revitalizes an aging steam system without straining the grid and delve into the complexities of decentralizing campus steam infrastructure. This session offers practical insights and lessons learned, demonstrating how decarbonization

initiatives can be scaled and replicated across campuses, portfolios and entire districts. Join us to uncover effective frameworks for accelerating decarbonization.

1.Similar Decarbonization Goals, Different Decarbonization Paths for Two District Energy Systems *Blake E Ellis, PE, Burns & McDonnell, Kansas City, MO*

2.Decarbonizing Campus Infrastructure: A California College Example *Kent Peterson*, *P2S Inc.*

3.Repurposing Infrastructure for Sustainability: The Future of District Energy in Denver *John Goodin*, *CMTA*

4.The Hidden Challenge of Decarbonization: Lessons from a Campus-Wide Case Study Michelle Kiana Shadpour, PE, Full Member, SC Engineers, Inc, San Diego, CA

Thursday, October 23

Thursday, October 23, 9:40 AM - 10:40 AM

Panel (Basic)

Careers in Building Decarbonization: Navigating an Emerging Industry

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Grand Ballroom

Chair: Amanda L. Webb, PhD, Full Member, University of Cincinnati, Cincinnati, OH, Sandra Henry, LEED-AP, Slipstream, Chicago, IL and Kelly Westby, PE, Steven Winter Associates, New York, NY

As building decarbonization has developed as technical service, it has also emerged as a career path, with related skills, knowledge and competencies. This panel discussion brings together experienced professionals to reflect on this new industry. Panelists describe their own career path in building decarbonization, identify emerging professional roles and highlight critical skills and knowledge necessary for this work. The audience is encouraged to submit questions for the panelists.

9:40 AM - 10:40 AM

Panel (Intermediate)

Scaling Residential and Commercial Decarbonization Retrofits in California

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Promenade Ballroom

Chair: Carrie A Brown, Ph.D., Full Member, Resource Refocus LLC, Oakland, CA and Rob Best, Arup, San Francisco, CA This session highlights three projects advancing large-scale building decarbonization retrofits in California. The BayREN "Existing Buildings Study" equips Bay Area local governments with data on building characteristics, energy use and greenhouse gas emissions via an interactive dashboard. It identifies key actions needed to decarbonize the most common building types by 2045, with a focus on equity impacts. As the most comprehensive regional overview to date, the dashboard offers jurisdictionlevel insights into building type, age, tenure and energy intensity—enabling informed, targeted climate action. The California Air Resources Board (CARB) "Building Readiness Assessment" evaluates the proportion of California's nonresidential buildings that are equipped to install zero-emission equipment for space and water heating, cooking, laundry and pool/spa heating. Readiness was assessed based on factors such as electrical panel capacity, breaker space, wiring, available interior and land space, roof integrity and service entrance capacity. The CARB "Propane Utilization in Buildings across California" study investigates propane use in residential and nonresidential buildings across California and explores pathways to adopt zeroemission space and water heating. Through surveys and secondary data, the study characterizes current propane utilization and evaluates zero-emission alternatives using large-scale prototype modeling—assessing impacts on energy use, emissions, utility bills and incremental costs.

9:40 AM - 10:40 AM

Seminar (Intermediate)

Turning Up the Heat: Unlocking the Value of Data Center Waste Heat

Track: Blueprints for Change: Policies, Standards and Programs

Room: Astor Room

Chair: Stet Allen Sanborn, AIA, SmithGroup, San Francisco, CA

As data centers grow in scale and density—driven by AI, high-performance computing and liquid cooling technologies—the opportunity to harness their waste heat has never been greater. This session explores how waste heat can be transformed from a

byproduct into a valuable resource for heating buildings, supporting innovation districts, and enabling sustainable urban development. Drawing on case studies from the Milwaukee School of Engineering, the National Renewable Energy Laboratory and Argonne National Laboratory, we'll examine how integrated design strategies and advanced metrics like Energy Reuse Factor (ERF) and Energy Reuse Effectiveness (ERE) are reshaping the conversation around data center efficiency. Join us to discover how waste heat can become a currency for resilience, sustainability and economic development—turning "not in my backyard" into "welcome to the neighborhood."

1.Owner's Perspective

Raymond Parpart, University of Chicago, Chicago, IL
2.District Energy Approach
Vance Nall, SmithGroup, Washington, DC
3.System and Waste Heat Analysis
Victor Braciszewski, P.E., Associate, SmithGroup, WASHINGTON, DC

9:40 AM - 10:40 AM

Seminar (Intermediate)

Smart Buildings, Smarter Grids: Cutting Peaks and Carbon by Harnessing Building Controls

Track: Beyond Decarbonization: Flattening Utility Demand, Considering Resilience and More Room: Riverfront Room

Chair: Jeff Kemp, PE, SmithGroup, Chicago, IL, Ekua Davis, PE, Member, Carrier, Chicago, IL, Mark Beals, Automatic Logic, Muncie, IN and Ionel Petrus, PE, SmithGroup, Washington, DC

This seminar explores the opportunities presented by OpenADR (Open Automated Demand Response) to optimize building operations using input from power utilities. Presenters cover key design considerations for enabling grid interactivity, including strategies such as load shedding and peak shifting to help reduce carbon emissions. A real-world case study is presented to illustrate how these concepts can be effectively applied in building projects.

1.Case Study Review of Open ADR

Ekua Davis, PE, Member, Carrier, Chicago, IL

2. Utilizing Open ADR in the BAS Environment

Mark Beals, Automatic Logic, Muncie, IN

3.BAS Design Considerations for Automated Demand Response

Jeff Kemp, PE, SmithGroup, Chicago, IL

Thursday, October 23, 11:00 AM - 12:30 PM

Panel (Intermediate)

Scaling Community-Driven Resilience and Decarbonization: The Heaven and Earth Initiative at St. Peter's-San Pedro

Track: Beyond Decarbonization: Flattening Utility Demand, Considering Resilience and More Room: Riverfront Room

Chair: Laura Dyas, PE, CEM, LEED AP O+M, Full Member¹, Laura Dyas, PE, CEM, LEED AP O+M, Full Member¹, Abigail Despres², Larry Lessard, PG, AI, CGD, CGI³ and Nathan Ives⁴, (1)B2Q Associates, Inc., Andover, MA(2)Clean Energy Solution, <i>Inc, Boston, MA(3)Achieve Renewable Energy, LLC, Salem, MA(4)Saint Peter's-San Pedro Episcopal Church, Salem, MA In 2024, Saint Peter's-San Pedro Episcopal Church launched the Heaven and Earth Energy Initiative to explore the feasibility of building decarbonization and resilience across multiple facilities through a community solar and battery storage microgrid ("Heaven") and a networked geoexchange system ("Earth"). In partnership with the City of Salem. This initiative demonstrates how public-private collaboration can accelerate scalable retrofits in underserved communities. This session explores the technical feasibility, financing mechanisms, community engagement approaches, lessons learned and the steps being taken to make St. Peter's-San Pedro a scalable model for climate-resilient infrastructure in other communities.

11:00 AM - 12:30 PM

Panel (Intermediate)

A Toolkit: Design, Finance, Build and Operate Affordable Multifamily

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Promenade Ballroom Chair: Nicholas Jones, Senior Energy Efficiency Consultant, Eversource, Berlin, CT, Karla Butterfield, Sustainability Director, Steven Winter Associates, Inc., Norwalk, CT, Paul Selnau, Architect, Schadler Selnau Associates, P.C., Farmington, CT and W. Mark Gendron, PE, Member, Acorn Consulting Engineers, Inc., West Simsbury, CT

Eagleville Green provides 41 truly mixed-income (very low -30% AMI, low -60% AMI, and market rate) dwelling units in seven buildings. The light-filled homes provide families, couples and individuals stacked flats and townhomes meeting Passive House (PHIUS) certification while emphasizing neighborhood connectivity, durability and ease of continued maintenance. The project became reality through local, state and federal financing and grants as well as utility incentives. Maximizing the thermal envelope, air sealing and HVAC equipment and appliances brings the predicted HERS Index to 40 before PV and 0 after. Located in a relatively clean utility grid area, the Carbon Index is also 40. The BEAM Tool was utilized as proof of concept for lower embodied carbon materials and finishes to help maximize whole-life carbon best practices. Presenters demonstrate how Eagleville Green was designed, financed, built and now operates as a sustainable, durable, affordable community.

11:00 AM - 12:30 PM Panel (Intermediate)

Is Zero Even Possible?

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Grand Ballroom

Chair: Elizabeth K Tomlinson, PE, Full Member, Stantec, Calgary, AB, Canada, Efrie Escott, AIA, LEED AP BD+C, LCACP, LFA, Schneider Electric, Philadelphia, PA, Matt Roberts, PhD, Affiliate, UC Berkeley, Berkeley, CA, Jack Rusk, Co-founder c.scale, Climate Scale, Inc., San Francisco, CA, Andres Gutierrez, Stok and Peter Haas, PhD, Center for Neighborhood Technology, Chicago, IL

Can the built environment ever *really* achieve net zero carbon? Using a whole-life perspective inspired by the new ASHRAE 240P standard, this debate considers the questions around retrofitting existing buildings to achieve zero operational carbon emissions, tradeoffs between operational and embodied carbon, calculation methodologies for grid-based emissions, and using offsets to achieve net-zero whole life carbon status. Can on-site energy generation ever *really* count as carbon-negative? How do you determine if the upfront embodied carbon investment to reduce energy demand by replacing the mechanical system is "worth it" from a global emissions perspective? Should we be privileging the retrofit of existing buildings or the construction of new zero-emissions buildings? Can offsets negate the emissions that occur during the manufacturing and construction phases? Watch globally-recognized experts debate these questions and those provided by the audience in a lively and interactive session. You be the judge!

11:00 AM - 12:30 PM

Seminar (Intermediate)

Rising to the Design Challenge of Efficient Electrification for Laboratories: Case Studies

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Astor Room

Chair: Kevin Ricart, Member¹, Atiya Hasan, P.E.¹, Kurt A Cunningham, PE² and Marina L Hill, Associate³, (1)SmithGroup, Washington, DC(2)SmithGroup, Detroit, MI(3)SmithGroup, Milwaukee, WI

Designing fully electrified laboratory spaces presents a significant challenge due to the high peak heating and cooling demands and the critical operations housed within these facilities. This session explores three real-world case studies of electrified laboratories, each with unique modalities, demonstrating effective power management strategies, advanced plant controls, cutting-edge technologies and load optimization approaches. Attendees gain practical insights into designing laboratories that align with sustainability goals while ensuring efficiency and operational resilience.

1.Case Study: Princeton Plasma Innovation Center

Atiya Hasan, P.E., SmithGroup, Washington, DC

2.Case Study: National Renewable Energy Laboratory - Energy Materials and Processing at Scale *Kevin Ricart, Member, SmithGroup, Washington, DC*

3.Case Study: Virginia Tech Innovation Campus Academic Building Kurt A Cunningham, PE, SmithGroup Inc, Detroit, MI

> Thursday, October 23, 2:10 PM - 3:40 PM Panel (Intermediate)

MEP Whole Life Carbon: What Moves the Needle?

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Grand Ballroom

Chair: Kavleigh Houde, Associate, BuroHappold, New York, NY, Nathan Kegel, Associate, IES Ltd, Omaha, NE, Stet Allen Sanborn, AIA, Smithgroup, WASHINGTON, DC, Cory Duggin, Full Member, TLC Engineering Solutions, Nashville, TN, Spencer Jarrett, One Click LCA and Wyatt Ross, Associate Member, CMTA, Cincinnati, OH

MEP systems represent a significant portion of a building's carbon footprint, yet the industry lacks comprehensive data on their whole life carbon impacts. This panel brings together industry experts from the MEP 2040 Whole Life Carbon Pilot to explore three critical aspects of MEP carbon assessment: benchmarking, measurement methodologies, and impact analysis. We'll begin by examining current whole life carbon benchmarking practices for MEP systems, highlighting key metrics and industry baselines. The discussion then delves into practical methodologies for measuring embodied carbon in MEP components, addressing challenges in data collection and evaluation. Finally, we'll analyze which interventions most effectively reduce MEP carbon impacts, from material selection to system optimization. Through case studies and real-world examples, attendees gain actionable insights into quantifying and reducing MEP carbon emissions. This session is particularly relevant for mechanical engineers, sustainability consultants and building owners seeking to understand and minimize their projects' whole life carbon footprint.

2:10 PM - 3:40 PM

Seminar (Intermediate)

Designing for Resilience: Energy, Water, Ecology and Agriculture in Rural

Decarbonization

Track: Beyond Decarbonization: Flattening Utility Demand, Considering Resilience and More Room: Riverfront Room

Chair: Marya Thawer, Student, Introba, Los Angeles, CA, Chad Adams, AICP - American Institute of Certified Planners, Ground Plan Studio, Philadelphia, PA, Jim Remlin, LEED AP and PE, Sherwood Design Engineers, Atlanta, GA, Michael McGraw, CSE, OAWB, ACE, Princeton Hydro, PA and Max Zahniser, AIA, 7group, Philadelphia, PA

Linkhaw Farms is a sustainable neighborhood development bringing housing and economic opportunity to Lumberton, North Carolina, a rural city of 15,000 residents reliant on agriculture. This project attracts investment while strengthening the community's resilience to climate-related disasters. Designed through a holistic, interdisciplinary approach, it integrates urban planning, regenerative agriculture, ecology and engineering to promote health, sustainability and economic growth. By partnering with the local community, the development aligns with their needs while delivering lasting value. Linkhaw Farms achieves decarbonization at scale through mitigation, adaptation and sequestration. Regenerative agriculture sequesters carbon in soil and biomass while supporting food production and ecological restoration. A solar-powered microgrid will supply clean electricity, with battery storage enabling energy exports for financial sustainability. A district thermal network will reduce energy demand, cutting utility costs and maximizing renewable energy use. Integrated water systems will support agriculture and mitigate flood risks, enhancing climate resilience. This session features experts from each discipline showcasing how their contributions create a sustainable, scalable model for rural development. Together, they demonstrate how an integrated design approach fosters a thriving, self-sufficient community greater than the sum of its parts.

1.A Resilient and Lucrative Microgrid Design to Enable Decarbonization at Scale

Eric Solrain, PE, LEED AP, Member¹ and Marya Thawer, Student², (1)Introba, Oakland, CA, (2)Introba, Los Angeles, CA

2.Sustainable Water Infrastructure at Linkhaw Farms

Jim Remlin, LEED AP and PE, Sherwood Design Engineers, Atlanta, GA

3.Ecological Restoration as a Decarbonization Strategy

Michael McGraw, CSE, QAWB, ACE, Princeton Hydro, PA

4.Regenerative Agriculture and Community

Chad Adams, AICP - American Institute of Certified Planners, Ground Plan Studio, Philadelphia, PA

2:10 PM - 3:40 PM

Seminar (Intermediate)

UT Austin Utility Plant Decarbonization/Designing Buildings, Infrastructure and Central **Plants to Meet Campus Decarbonization Goals**

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Promenade Ballroom

Chair: Travis Bather, P.E., KFI Engineers, Minneapolis, MN and Xavier Rivera Marzan, UT Austin, Austin, TX Decarbonization efforts at the campus-level are being explored nationwide - many of which are looking at ways to decarbonize

buildings one at a time; however, campus-level decarbonization, especially through decarbonization of the central utility plant,

can help streamline some of the technical and financial challenges. This session walks through UT Austin's approach to exploring, the key considerations and challenges, and why carbon capture, utilization and storage (CCUS) is a lucrative solution. Using this framework, a techno-economic case study for CCUS integration on campus is discussed highlighting the approach taken, key considerations for both retrofits and new builds, impacts to the steam and power sent to buildings on campus, and the benefits of early design integration and sizing to new utility plants.

1.Laboratory Decarbonization and Integration with the UC Berkeley Clean Energy Campus

Brian C Johnson, PE, BEMP, Full Member, HOK, San Francisco, CA

2.UC Berkeley Clean Energy Campus Decarbonization Implementation

James Falconer, PE, CEng, Affiliated Engineers, San Francisco, CA

3.UT Austin - Utilities Evaluation

Ryan Thompson, P.E., UT Austin, Austin, TX

4.CCUS Techno-Economic Considerations

Emily Kunkel, P.E., Thornton Tomasetti, Chicago, IL

5.Cogen Integration Considerations for CCUS

Travis Bather, P.E., KFI Engineers, Minneapolis, MN

6.UT Austin Utility Plant Decarbonization

Emily Kunkel, P.E., Thornton Tomasetti, Chicago, IL

2:10 PM - 3:40 PM Seminar (Intermediate)

The Art of Decarbonization

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Astor Room

Chair: Fiona Martin McCarthy, P.E., Full Member, Grumman/Butkus Associates, EVANSTON, IL

The Museum of Modern Art (MoMA) is a world-class art museum located in New York City. MoMA has a commitment to sustainability and is required to meet New York City Local Law 97 (LL97), which establishes a Building Performance Standard (BPS) for New York with a goal of reducing citywide carbon emissions by 40%. As part of these initiatives, MoMA has undertaken several projects to reduce energy consumption and carbon emissions to avoid fines as established by LL97. A multiphase capital plan was designed to meet both the 2024 and 2030 LL97 targets while addressing operational risk, energy use and high-value return on investment. This session focuses on energy, resource and carbon efficiency upgrades to a large museum—boosting facility reliability and helping to safeguard the artworks while increasing the comfort of users, staff and maintenance staff. The speakers provide details regarding the projects already implemented and under construction, as well discussing benefits of real-time energy consumption tracking and fault detection analytics.

1. Beyond the BPS: Owner Motivation and Buy-In

Jason K Smith, Department of Real Estate and Construction Museum of Modern Art, New York, NY

2. Realizing the Savings: Whole Building Analysis, Plan and Design

Heather Ray Beaudoin, PE, BEMP, Associate and Tim Shinnick, Grumman/Butkus, Evanston, IL

3.From Data to Decarb: Turning BAS Trends into Carbon and Cost Savings

Justin D'Arcy, Grumman Butkus Associates, Evanston, IL

Thursday, October 23, 4:00 PM - 5:00 PM

Panel (Intermediate)

Beyond Best Practice: Realizing the Opportunities of Whole Life Carbon Assessment

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Astor Room

Chair: Brad Benke, Researcher, Carbon Leadership Forum, Kelsey Rose, Senior Manager - Embodied Carbon, Hines, Houston, TX, Jack Rusk, Co-founder c.scale, Climate Scale, Inc., San Francisco, CA and Brad Benke, Researcher, Carbon Leadership Forum, Houston, TX

Each building is a nexus in a global network of energy systems and material supply chains, but traditional approaches to decarbonization treat these as separate concerns. The emerging whole-life carbon assessment (WLCA) paradigm, instantiated in the upcoming ASHRAE/ICC 240P standard, is beginning to change this. WLCA presents opportunities to comprehensively assess emissions, evaluate tradeoffs between operational and embodied impacts, and align building sector goals with broader climate commitments. However, due to gaps in common practices, data sources, tools and workflows, the design industry has yet to realize WLCA opportunities at scale. This session explores the current state of carbon assessments in the design industry and ways to catalyze greater momentum. Panelists share how to leverage existing data, workflow-integrated tools, integrative design processes and lessons from real-world decarbonization case studies. Importantly, this includes cutting-edge resources, practices

and methodologies for realizing WLCA goals in the face of industry limitations. Attendees learn to evaluate embodied and operational tradeoffs, utilize available benchmarking data to set targets, compare emissions across sources and geographies and connect building-level design strategies with organizational or regulatory decarbonization mandates.

4:00 PM - 5:00 PM

Panel (Intermediate)

Community-Scale Geothermal: Ann Arbor Targets Carbon Reduction in an Underserved Neighborhood

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Promenade Ballroom

Chair: Adam McMillen¹, Adam McMillen¹, Joe Lange² and Jessica Lee, LEED AP BD+C¹, (1)IMEG, Chicago, IL(2)City of Ann Arbor, Ann Arbor, MI

The City of Ann Arbor, MI, one of 11 communities selected by the U.S. Department of Energy's Geothermal Technologies Office to design a community-scale geothermal heating and cooling system, is committed to achieving carbon neutrality across the entire community by 2030. In pursuit of this goal, the city has chosen to focus on an underserved, energy-burdened neighborhood of 262 households - 75% of which are low-income, with over half being minorities and renters. This session, presented by Ann Arbor's Senior Energy Analyst alongside Building Performance and Sustainability engineers from IMEG, showcase the design of a community-scale geothermal system and distributed solar PV that will be implemented for all residential households, a local school, a community mental health service center and the city's public works facility. This combination will make this neighborhood the first fully decarbonized, low-income community in the country. Join us to learn how this project aims to reduce the neighborhood's greenhouse gas emissions by 40%, eliminate energy burdens for low-income residents, improve indoor air quality and enhance year-round comfort, all while advancing the transition to a more equitable and sustainable future for the community.

4:00 PM - 5:00 PM

Seminar (Intermediate)

Decarbonizing Cities, One Building at a Time

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation

Room: Grand Ballroom Chair: Martin Roy, P.Eng, Leed Fellow, Full Member, Martin Roy et Associes Inc Consulting, Deux-Montagnes, OC, Canada, Elverson Mitchell Swann, P.E., Life Member, Resolution Management Consultants, Inc., Philadelphia, PA and Lianne

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

This session explores large-scale municipal decarbonization initiatives aimed at improving energy efficiency and reducing carbon emissions in existing building stock. It highlights two case studies: Laval's retrofit of 30 municipal buildings and Philadelphia's Built to Last program, which integrates housing assistance programs to enhance energy performance in low-income households. Attendees gain insights into the technical, financial and policy strategies used to implement successful retrofits, including energy audits, system upgrades and funding coordination. The session addresses key challenges such as integrating modern mechanical and electrical systems into aging infrastructure, maintaining operations during construction and navigating regulatory frameworks. By examining the early results and lessons learned from these initiatives, participants better understand how to scale similar projects in their own municipalities. The session provides a practical roadmap for decarbonization, equipping attendees with best practices for optimizing energy performance, securing funding and ensuring long-term sustainability.

1.One House at a Time: Implementing Energy Efficiency and Decarbonization in Low Income Urban Households Elverson Mitchell Swann, P.E., Life Member, Resolution Management Consultants, Philadelphia, PA

2. Scaling Municipal Decarbonization: Laval's Roadmap for Retrofit Success Martin Roy, P.Eng, Leed Fellow, Full Member, Martin Roy et Associes Inc Consulting, Deux-Montagnes, OC, Canada

4:00 PM - 5:00 PM

Seminar (Intermediate)

Planning for a Resilient Future at UC Merced: Campuswide Decarbonization considering **Projected Growth and Shocks and Stressors**

Track: Beyond Decarbonization: Flattening Utility Demand, Considering Resilience and More Room: Riverfront Room Chair: Stet Allen Sanborn, AIA¹, Dan Small¹ and Cynthia A Cogil, Vice President, Fellow Member², (1)SmithGroup, San Francisco, CA(2)SmithGroup, Chicago, IL

This seminar outlines a case study of decarbonization master planning at UC Merced integrating projected future campus growth with climate action plan goals, utility master planning to understand phased impact on infrastructure, with the impact of various strategies projected by employing sliders on an interactive dashboard to inform capital planning.

1.UC Merced: Planning for a Resilient Future

Stet Allen Sanborn, AIA, SmithGroup, San Francisco, CA

2.UC Merced: Planning for a Resilient Future: Campuswide Decarbonization Considering Projected Growth and Shocks and Stressors

Dan Small, SmithGroup, San Francisco, CA

Friday, October 24

Friday, October 24, 9:40 AM - 10:40 AM Panel (Intermediate)

Navigating Emerging Priorities for Energy Efficiency Program Administration

Track: Blueprints for Change: Policies, Standards and Programs

Room: Riverfront Room

Chair: Desmond Kirwan¹, Jacqueline Freidel¹, Claire Miziolek² and Mitch Horrie³, (1)Focus on Energy, Madison, WI(2)Energy Solutions, Boston, MA(3)Office of Energy Innovation, Madison, WI

Energy efficiency programs are evolving to encompass new objectives beyond traditional energy savings. States have started leveraging energy efficiency as the optimal mechanism to reduce carbon emissions, promote beneficial electrification, capture time-sensitive grid savings and tackle other emerging needs. However, there is not a clear avenue for utilities and program administrators to meet these new priorities under existing regulatory frameworks. In 2022, the Public Service Commission of Wisconsin (PSC) directed the statewide efficiency program FOCUS ON ENERGY® (Focus) to begin exploring how to take on a larger role in these areas, signaling a strategic shift in program goals. In collaboration with Energy Solutions, Focus recently launched a research project that follows a holistic, sequential approach to create a roadmap for navigating emerging priorities. The research employs a four-phase strategy: Synthesize, Empower, Analyze and Plan - to integrate regulatory directives with practical market interventions. This intentional design offers a scalable solution for the program to make an informed transition. The panelists cover interim results from the Environmental and Economic Research and Development Program and Future Focus Initiative, showcasing Focus as a model for the future of efficiency programs.

9:40 AM - 10:40 AM

Panel (Intermediate)

Decarbonizing Campuses: Scaling Solutions for Multi-Building Portfolios and District Energy Systems

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Promenade Ballroom

Chair: Ghina Annan, M.Eng Applied Energy, Associate¹, Ghina Annan, M.Eng Applied Energy, Associate¹, Jeffrey D. Schroeder, Full Member², Tom Abram Abram³ and Ghina Annan, M.Eng Applied Energy, Associate¹, (1)Stantec, Calgary, AB, Canada(2)Stantec Consulting Ltd.(3)Introba

As campuses strive toward ambitious net-zero carbon goals, they face unique challenges in addressing diverse building portfolios, aging infrastructure and district energy systems. This panel explores a scalable and strategic approach to decarbonization, combining energy benchmarking, conservation strategies, renewable energy integration and financial feasibility to achieve significant emissions reductions. The panelists also address operational challenges unique to campuses, such as stakeholder engagement, campus-wide buy-in and phased implementation strategies. The University of Windsor serves as an example of this approach. The institution developed a carbon-neutral master plan for its campus of more than 50 buildings and a

district energy system, with a goal of achieving net-zero by 2050. Lessons from Windsor's efforts include balancing energy efficiency with electrification, planning for district energy retrofits and aligning with long-term cost-effective strategies.

9:40 AM - 10:40 AM

Seminar (Intermediate)

Decarbonizing at Scale: Using AI to Move Fast (and Accurately) for Large Real Estate Portfolios

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Grand Ballroom

Chair: Apoorv Goyal, Amazon, New York City, NY, Shreshth Nagpal, CEO, Member, Carbon Signal, New York City, NY and Ryan Sit, Associate, Carbon Signal, Toronto, ON, Canada

Many organizations are taking action to reduce their carbon emissions. This session presents the AI-enabled analytics and processes used by one company to accelerate the decarbonization of its large real estate portfolio. The session begins with context on the legislative, reputational and financial drivers of decarbonization for real estate. The presenters then describe different tools available for portfolio decarbonization, and highlight the tradeoffs between using conventional engineering approaches compared with innovative AI and machine-learning analytics for decarbonization. The presentation utilizes and shares candid real-world examples one organization needed to make in its decarbonization journey and next steps as it moves forward on its carbon commitments. By the end of the session, participants will leave with a good understanding of the importance of decarbonization in the real estate sector, and the resources and technology available for achieving decarbonization at scale for building portfolios.

1.Scaling Building Decarbonization Retrofits with AI and Building Physics Models *Shreshth Nagpal, CEO, Member, Carbon Signal, New York City, NY*

2.A Case Study in Scaling Portfolio Decarbonization with AI-Driven Analytics *Apoorv Goyal, Amazon, New York City, NY*

9:40 AM - 10:40 AM

Seminar (Intermediate)

From Surface to Core: Unleashing Deep Well Geothermal and Heat Pump Technology

Track: Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies) Room: Astor Room

Chair: Amy Xu, P.Eng., Associate Member, AME Group, Victoria, BC, Canada, Murdoch D MacPherson, P.Eng., Life Member, MacPherson Engineering Inc, Regina, SK, Canada, Neil Struthers, P.Eng, City of Regina, Regina, SK, Canada and Cailin MacPherson, P.Eng., Associate, Macpherson Engineering Inc, Régina, SK, Canada

As climate change reshapes the energy landscape, decarbonizing in cold climates has additional challenges and requires innovative solutions. This session explores advanced heat pump technologies and deep well geothermal systems, emphasizing their applications, strategies and hybrid solutions. Redundancy considerations for reliable operation in extended sub-zero conditions and low carbon strategies is examined. The speakers present case studies and lessons learned from previous projects, demonstrating feasibility, opportunities and collaborative partnerships essential for success. Central to this session is the new indoor aquatic facility in Regina, Saskatchewan — Canada's first to harness direct-heat deep geothermal energy. This visionary project not only serves as a hub for wellness and community but also sets a new standard for sustainable development. Adopting innovative technologies from a civic perspective is crucial. Hear firsthand from the City of Regina about the research, funding, and implementation of this pioneering technology, and gain insights into the feasibility, opportunities and partnerships driving the project. Join us for an engaging session that dives deep into the potential of heat pump and geothermal technologies and discover how these advancements pave the way for a low-carbon future in cold climates.

1.Heat Pump Technologies in Cold Climates: Applications, Strategies and Case Studies Amy Xu, P.Eng., Associate Member, AME Group, Victoria, BC, Canada

2.Deep Well Geothermal Systems in Cold Climates: Fundamentals, Innovations and Global Case Studies

Murdoch D MacPherson, P.Eng., Life Member, MacPherson Engineering Inc, Regina, SK, Canada

3.Innovative Pathways to Sustainable Development: The Regina Aquatic Centre Case Study

Neil Struthers, P.Eng, City of Regina, Regina, SK, Canada

Friday, October 24, 11:00 AM - 12:00 PM

Seminar (Basic)

On the Frontiers of Statewide Building Decarbonization Policy: A Maryland Case Study

Track: Blueprints for Change: Policies, Standards and Programs

Room: Riverfront Room

Chair: Zach Berzolla, Ph.D., Associate Member¹, Emily Levin², Ben Roush, PE-ME, FPE, LEED AP BD+C, CCP, Member³ and Zach Berzolla, Ph.D., Associate Member¹, (1)Maryland Department of the Environment, Baltimore, MD(2)NESCAUM, Boston, MA(3)FSi Engineers, Baltimore, MD

Maryland is implementing a suite of building decarbonization policies that aim to reduce emissions, improve air quality and public health, and save Marylanders money. These policies are a Building Energy Performance Standard, a Clean Heat Standard, and a Zero Emissions Heating Equipment Standard. Learn more about these policies, how they interact and their impact on projects. The session also describes how other states are advancing similar policies. Hear from representatives from Maryland developing the policy, an engineer helping Maryland clients navigate the rapidly changing landscape and a nonprofit helping develop and implement emissions-based policies in other states.

1. Maryland's Building Decarbonization Policies

Zach Berzolla, Ph.D., Associate Member, Maryland Department of the Environment, Baltimore, MD 2.Nescaum's Zero-Emission Heating Equipment Standards Model Rule, a Template for States

Emily Levin, NESCAUM, Boston, MA

3.Maryland's Building Energy Performance Standards: History and System Design Impacts Ben Roush, PE-ME, FPE, LEED AP BD+C, CCP, BEAP and BEMP, Member, FSi Engineers, Baltimore, MD

11:00 AM - 12:00 PM

Seminar (Basic)

Scaling Campus Carbon Reduction with Targeted Building Actions

Track: Scaling Decarbonization: Transitioning from Bespoke Solutions to Broad Implementation Room: Promenade Ballroom

Chair: Jess Farber, Vice President, Member, CMTA, Boston, MA, Jason Volz, PE, LEEP AP BD+C, CEM, CMVP, Member, CMTA, Lee Ball, Catawba College and Wyatt Ross, Associate Member, CMTA, Cincinnati, OH

Achieving carbon neutrality in higher education requires more than good intentions—it demands strategic alignment of campus planning, capital investment and stakeholder action. Many institutions face significant challenges: aging infrastructure, evolving programmatic needs, constrained budgets and a backlog of deferred maintenance. This session offers a practical roadmap for advancing decarbonization while navigating these barriers. Through three integrated perspectives, attendees learn how to embed decarbonization within broader institutional planning and budgeting processes. The seminar explores how to prioritize investments using building and energy data, leverage green revolving funds and asset preservation dollars, and align retrofit opportunities with long-term institutional goals. Real-world examples from Rice University, Catawba College, and Northern Kentucky University demonstrate how these strategies translate into action—lowering emissions, unlocking capital, improving operational resilience and enhancing student well-being.

1. Campus Decarbonization through Master Planning Alignment

Jess Farber, Vice President, Member, CMTA, Boston, MA

2.Putting University Decarbonization Plans to Work

Jason Volz, PE, LEEP AP BD+C, CEM, CMVP, Member, CMTA

3.Driving Institutional Change for Campus Decarbonization *Lee Ball, Catawba College*