ASHRAE TC 2.8 Past Programs List

Winter / Annual	Date/ Location	Progam Descriptions	Presenters
Winter	Feb 2026- Las Vegas, NV	**A Presidential Debate by College of Fellows: IEQ vs Decarbonization** As the building industry navigates continuously evolving needs and regulations, two essential goals, Indoor Environmental Quality (IEQ) and Decarbonization, often appear to be in conflict. In this engaging and timely debate, Past President Ginger Scoggins and current Society President Bill McQuade take the stage to explore the dynamic relationship between occupant health and environmental responsibility. This session tackles the complex trade-offs, synergies and engineering challenges inherent in balancing these two critical priorities. Join us for a thought-provoking presidential-level exchange that asks: Can we have both? Or must we choose?	
Winter	Feb 2026- Las Vegas, NV	**Building-integrated solar and thermal systems: a path towards decarbonization** This seminar explores Building-Integrated Photovoltaic (BIPV) and Building-Integrated Photovoltaic/Thermal (BIPV/T) systems as innovative solutions for sustainable architecture. These technologies enable buildings to generate renewable electricity—and in the case of BIPV/T, useful heat—while serving as functional building elements. The seminar will highlight their design principles, performance benefits, and integration challenges. Emphasis will be placed on their role in reducing operational carbon emissions and advancing decarbonization goals in the built environment	
Winter	Feb 2026- Las Vegas, NV	**Renewable Energy Myth Busting: Common Concerns and Their Solutions and Why it Matters** On-site renewables have an important role in decarbonizing the built environment and the electricity sector, but their implementation can sometimes be hampered by negative public perception. While some of these concerns are grounded in real experiences, others stem from misunderstandings or a lack of information. This panel explores common concerns such as noise from wind turbines, glare from solar panels, and regulatory and land-use challenges and discuss their perceived and actual impacts. It will also touch on how to address these issues through thoughtful design, better communication, and inclusive planning to support a smoother and more equitable energy transition.	
Annual	June 2025 - Phoenix, AZ	**Future-Proofing Our Infrastructure: Optimizing Energy, Air Quality and Sustainability in Building Systems** This study explores the integration of building energy management, indoor air quality (IAQ), and clean energy solutions. Elevated indoor CO2 levels impact occupant health and energy consumption. The research demonstrates the use of Generative Adversarial Imitation Learning (GAIL) to optimize variable air volume (VAV) systems, achieving energy savings and reducing discomfort. Additionally, the Urban Sewage State Prediction Model (USSPM) is applied to assess sewage heat utilization, with case studies highlighting how building types and spatial distribution affect heat recovery. Recommendations for efficient system installations emphasize the potential of leveraging sewage heat and improving IAQ and energy efficiency sustainably.	
Annual	June 2025 - Phoenix, AZ	**Faster, Better, Stronger: Resiliency in the Design, Construction and Operations of High Intensity Facilities** As the global economy digitizes, the demand for more computer processing continues to grow. This demand has put pressure on developers and manufacturers to deliver faster and more powerful chips to the market faster. Along with this "use" demand, there are competing pressures to reduce energy consumption and environmental footprint both in production and in use. Getting projects done quickly, done right and running reliably is crucial in fast developing technologies with global pressure points. This program looks at three aspects of current high-tech facility design, construction and operations: speed of delivery; carbon footprint and resiliency.	
Winter	February 2025 - Orlando	**Applying Trusted Fundamentals to Address Our Changing Climate through New Technology and Vernacular Architecture Applications** 1. Isothermal Compression for Hotter Climate Yunho Hwang, PhD, University of Maryland/Department of Mechanical Eng, College Park, MD, USA 2. Designing Building Comfort Systems for Unprecedented High Temperatures Using Passive Principles of Vernacular Architecture in Historically Extremely Hot Climates Janice Means, PE, Retired from Lawrence Technological University, Southfield, MI, USA 3. The Effects of Elevated Temperatures on Humans and the Potential Solutions to Mitigate the Negative Effects Pawel Wargocki, Dr., DTU Environ and resource Eng-Tech Univ of Denmark, Kongens Lyngby, Denmark	Pawel Wargocki, Janice Means, Yunho Hwang

Winter	February 2025 - Orlando	**Building Decarbonization: Policy Goals, Performance Standards and Pathways for Optimizing Both Climate and Health** 1. How Difficult Will It be to Meet BPS Targets? Results of a Large-Scale Analysis Amanda Webb, PhD, University of Cincinnati, CINCINNATI, OH, USA 2. Developing a Framework to Evaluate Building Decarbonization Pathways Mohammad Heidarinejad, Ph.D., P.E., Illinois institute of Technology, CHICAGO, IL, USA 3. Quantifying Projected Health and Climate Co-benefits of Energy Conservation in the Built Environment Parichehr Salimifard, Assistant Professor, Oregon State, Corvallis, OR, USA	Amanda Webb, Mohammad Heidarinejad, Parichehr Salimifard
Annual	June 2024 - Indianapolis	**Electrifying the Future: Decarbonization Strategies for the Built Environment** 1. Commercial Solar Lighting Systems and Their Contribution to Decarbonization Goals Khalid Nagidi, EMCG, WANTAGH, NY, United States 2. Equitable Urban Renewable Energy Integration through Planning and Simulation Fengqi Li, Oak Ridge National Laboratory, Oak Ridge, TN, USA	Fengqi Li, Khalid Nagidi,
Annual	June 2024 - Indianapolis	**Help has Arrived! Decarbonizing Heating Systems for Buildings** 1. The Process of Creating Electrification Design Guidance Paul Torcellini, P.E., National Renewable Energy Laboratory, Golden, CO, USA 2. Digging in: Strategies for Electrifying Heating Systems Sammy Houssainy, National Renewable Energy Laboratory, MISSION VIEJO, CA, USA 3. Reality Hits: the Practical Aspects of Making Heating Systems Work Stet Sanborn, AIA, Smithgroup, WASHINGTON, DC, USA	Paul Torcellini, Stet Sanborn, Sammy Houssainy
Winter	January 2024 - Chicago	**Beneficial Electrification** 1. Beneficial Electrification of Mcfarland, WI Public Safety Building Andrew DeRocher, HGA, Minneapolis, MN, United States 2. Comed Schools Electrification Andrew Wiegand, Michaels Energy, La Crosse, WI, USA	Andrew DeRocher, Andrew Wiegand
Winter	January 2024 - Chicago	**Zero Emission Buildings (ZEB), Rolling out the Revised Energy Performance Buildings Directive (EPBD) in Europe** 1. Building Live Cycle Global Warming Potential: New Indicator Required By the Revised EPBD Livio Mazzarella, Prof politechnica Milano, Politechnico Milano, Milano, Italy 2. Primary Energy Calculation and New Zero Emission Building Requirements in the EPBD Jarek Kurnitski, Tallinn University of Technology, Tallinn, Estonia 3. Heat Pumps: a High Potential Solution to Decrease Operational CO2 Emissions in Buildings Catalin Lungu, Technical University of Civil Engineering Bucharest, Bucharest, Romania	Livio Mazzarella, Jarek Kurnitski, Catalin Lungu
Winter	January 2024 - Chicago	**Defining and Creating Buildings That Truly Perform at 'Net Zero'** 1. Moving Towards Net Zero Carbon Hospitals Francis Mills, Frank Mills Consulting, Leyland, United Kingdom 2. Delivering a Net Zero Commercial Office Building David Clark, P.Eng., C.Eng., FCIBSE, IntPE (UK), MASHRAE, Stantec, Waterloo, ON, Canada 3. Net Zero Delivery Presenting Author: Mick Schwedler, PE, Trane, Onalaska, WI, USA	Francis Mills, David Clark, Mick Schwedler
Winter	January 2024 - Chicago	**Decarbonization of the Federal Building Portfolio** 1. Decarbonization of the Federal Building Portfolio Kinga Hydras, General Service Administration, Washington DC, DC, USA 2. Renovation or New Construction: Assessing the Embodied Carbon of Buildings Sandrine Schultz, GSA, New York, NY, USA 3. U.S. Federal Government Approach to Decarbonization: Sftool and Product Search Michael Bloom, U.S.General Services Administration, General Service Administration, Washington DC, DC, USA	Kinga Hydras, Sandrine Schultz, Michael Bloom
Winter	January 2024 - Chicago	**Design Guidance for Climate Change** 1. Creating Building Resilience and Occupant Safety to Adapt to a Changing Climate Janice Means, PE, Retired from Lawrence Technological University, Southfield, MI, USA 2. Climate and Weather Data: Availability and Challenges Drury Crawley, PhD, Bentley Systems, Inc., Washington, DC, USA 3. Sufficiency-Efficiency-Renewable Framework to Adapt Buildings in a Changing Climate without Compounding the Problem Eric Peterson, PhD, PE, CEng, Visiting Research Fellow-Univ. of LEEDS, Leeds, West Yorkshire, United Kingdom	Janice Means, Drury Crawley, Eric Peterson

Winter	January 2024 - Chicago	**Strategies for Net Zero Energy Buildings** 1. Designing Net-Zero Energy Buildings Svein Morner, HGA, Inc, Middleton, WI, USA 2. Capturing the Potential of Distributed Energy Resources for Grid Transformation Veronique Delisle, Ing., Ph.D., Natural Resources Canada, Varennes, QC, Canada	Svein Morner, Veronique Delisle
Annual	June 2023 - Tampa	**Future Proofing our Built Environment through Global Collaboration** 1. Seminar: Presentation 1: Built Environment Standards in the Global South: The African Experience Akinbowale Soluade, AOS Consulting, South Africa 2. Collaboration Opportunities for ASHRAE in Emerging Economies: India Perspective Ashish Rakheja, AEON, Noida, India 3. Designing without Codes: The Story in Pakistan Farhan Mehboob, ASHRAE Region at Large 4. Adopting ASHRAE Standards in Brazil and Argentina Oswaldo de Siqueira Bueno, ASHRAE Region XII, Brazil	Akinbowale Soluade, Ashish Rakheja, Farhan Mehboob, Oswaldo de Siqueira Bueno
Annual	June 2023 - Tampa	**College of Fellows Debate: Engineers Have An Obligation To Decarbonize** Decarbonization is the hot (no pun intended) topic rolling through the design, construction and operations arenas of the built environment. The world is at the precipice of irreversible climate change. Engineers are at the heart of built environment, not just in design, but in the manufacture and operation of buildings and crucial infrastructure and the equipment and materials used to construct them. Reducing our societal carbon footprint is essential to pull back from this precipice. Engineers have an obligation to decarbonize. Yay or nay? Come hear the College of Fellows debate!	
Annual	June 2023 - Tampa	**Decarbonization of Buildings with Carbon Capture Tech: Post Combustion, Pre-Combustion and Direct Air Capture in the HVAC** 1. Reducing Carbon Emissions with Carbon Capture with Utilization or Storage: Techno-Economic Analysis Matt Lensink, P.Eng, CEM Engineering, Oakville, ON, Canada 2. Carbon Reduction Using Building Carbon Capture with a New York City Case Study Shane Johnson, Carbon Quest, Rosalia, WA, USA 3. Direct Air Capture System Integrated to Building Thermal Management Systems Kashif Nawaz, Oak Ridge National laboratory, Oak Ridge National Laboratory, Oak Ridge, TN, USA 4. Pre-Combustion Carbon Capture with Hydrogen Production in Light of New Federal Tax Credits: A Comparison of Three Production Methods James Leidel, DTE Energy, Rochester Hills, MI, USA	Matt Lensink, Shane Johnson, Kashif Nawaz, James Leidel,
Annual	June 2023 - Tampa	**Results from ASHRAE 1814-TRP, Actual Energy Performance of Secondary Schools Designed to Comply with ASHRAE Standard 90.1-2010** 1. Common Factors to Secondary Schools That Meet or Exceed Ashrae Standard 90.1-2010 Xiaohui Zhou, Dr., Slipstream, Madison, WI, USA 2. Comparison of the Actual Energy Performance of Secondary School Buildings: Ashrae 90.1- 2010 Vs. 2004 Zhihong Pang, Dr., Louisiana State University, Baton Rouce, LA, USA	Xiaohui Zhou, Zhihong Pang
Winter	February 2023 - Atlanta	**Building on Twenty Years of Guidance Toward Decarbonization: The ASHRAE GreenGuide** 1. Evolution of the ASHRAE Green Guide Thomas Lawrence, PhD, University of Georgia, Athens, GA, USA 2. What's New in the ASHRAE Green Guide 6th Edition? Janice Means, PE, Lawrence Technological University, Southfield, MI, USA	Thomas Lawrence, Janice Means
Winter	February 2023 - Atlanta	**Igniting a Carbon-free Fire around Building Science** 1. Lighting the Embers in Students through Competition Rachel Romero, NREL, Lakewood, CO, United States 2. The Inferno of Building Science Education Paul Torcellini, P.E., NREL, Lakewood, CO, United States 3. An Award Winning Design for Affordable Housing Samantha Morton, Georgia Tech, Atlanta, GA, USA 4. Firing up Funding for Affordable Housing Projects Pete Choquette, Georgia Tech, Atlanta, GA, USA	Rachel Romero, Paul Torcellini, Samantha Morton, Pete Choquette
Winter	February 2023 - Atlanta	**Accelerating Change in Building Design and Operation towards a Decarbonized and Net-zero Energy Future** 1. Integrating Modern Methods for Sustainable Built Environments Kevin Mitchell, CIBSE President, CEng, FCIBSE, CIBSE, London, United Kingdom 2. Improving MEP and Sustainability through Modular Design Improving MEP and Sustainability through Modular Design 3. Sustainable Lighting Methodologies and Selections to Minimize Building Carbon Footprints Jeff Nall, MCIBSE, Dialight, Sagamore Hills, OH, USA 4. Improving Building Performance with Intelligent Optimization David Green, CEng, FCIBSE, PE, CCP, Integral Group, Edmonton, Canada 5. Achieving Zero Energy Thomas Phoenix, PE, Mechanical Contractors, LLC, Greensboro, NC, USA	Kevin Mitchell, Jeff Nall, David Green, Thomas Phoenix

Winter	February 2023 - Atlanta	**Advanced Energy Design Guidance for Zero Energy and Carbon Multifamily Buildings** 1. The Process of Creating Advanced Energy Design Guides Paul Torcellini, P.E., National Renewable Energy Lab, Golden, CO, USA 2. Start with the Envelope and then Move to Lighting and Plug Loads Stet Sanborn, Smithgroup, San Francisco, CA, USA 3. We Are All in Hot Water: Addressing One of the Largest Loads in a Decarbonized Manner Daniel Nall, PE FAIA FASHRAE CPHC, Daniel Nall, Consultant, LLC, Princeton, NJ, USA 4. Bringing the Pieces Together with HVAC Carol Marriott, P. Eng., Trane Technologies, Maple Grove, MN, USA	Paul Torcellini, Stet Sanborn, Daniel Nall, Carol Marriott
Winter	February 2023 - Atlanta	**Fundamentals of Climate Science Part 2: Modern History and Physics** 1. Modern Climate Science History Stephen Tossey, P.E., SHP Leading Design, Cincinnati, OH, USA 2. Physics of Earth's Climate: Complexity in Feedback Mechanisms Xin Qiu, PhD, ACM, EP, P.Met, SLR Consulting (Canada) Ltd., Guelph, Canada 3. The Climate Crisis: Impacts and Actions Needed Scott Sherwood, Eco Care Corporation, New York, NY, USA	Stephen Tossey, Xin Qiu, Scott Sherwood
Winter	February 2023 - Atlanta	**Embodied carbon vs Operational Carbon: Tradeoffs and Choices for the Building Envelope** 1. Transforming Existing Buildings from Climate Liabilities to Climate Assets Eva Rosenbloom, RMI, CA, USA 2. Embodied Carbon and Affordable Housing Case Study Sara Bayer, AIA CPHC LEED AP, Magnusson Architecture and Planning, New York, NY, USA 3. Paths to Low Carbon in Buildings, New and Existing Steve Kemp, M.A.Sc., P.Eng., LEED® Fellow, RDH 4. Estimating the Avoided Carbon of Building Reuse with the Care Tool Lori Ferriss, Goody Clancy, Boston, MA, USA	Eva Rosenbloom, Sara Bayer, Steve Kemp, Lori Ferriss
Annual	June 2022 - Toronto/Hybrid	**College of Fellows Debate "Be Like Water:" Engineers Have a Duty to Address Climate Change Adaptation and Resilience**	
Annual	June 2022 - Toronto/Hybrid	**Climate Change Issues for Decarbonization, IAQ and Sustainable Buildings** 1. The Shocks and Stressor of Climate Change and the Impact upon IAQ and Occupant Health Joss Hurford, P.E., AEI Engineering, Maddison, WI, USA 2. The Fraternal Twins of Decarbonization and Climate Resilience Erin McConahey, P.E., Arup, Los Angeles, CA, USA	Joss Hurford, Erin McConahey
Annual	June 2022 - Toronto/Hybrid	**Fundamentals of Climate Science, Part 1: History and Physics** 1. Climate Science History Scott Sherwood, Eco Care Corporation, New York, NY, USA 2. Physics of Earth's Climate: Understanding Global Warming Daniel Villa, P.E., Sandia National Laboratories, Alamo (virtual employee), TX, USA 3. Recent Developments and Measurements Xin Qiu, Ph.D., SLR / Novus Environmental Inc., Guelph, ON, Canada	Scott Sherwood, Daniel Villa, Xin Qiu
Annual	June 2022 - Toronto/Hybrid	**Water Quality in Low Occupancy and Shutdown Buildings: Lessons Learned from COVID-19 Building Shutdowns** 1. Variable Legionella Response to Flushing after Moderate and Long-Term Plumbing Stagnation William Rhoads, Ph.D., Eawag, Dübendorf, MD, Switzerland 2. Can Flushing, Superheating and Shock Chlorination Control Legionella after Extended Stagnation? Michele Provost, Ph.D., Polytechnique Montreal, Montreal, QC, Canada 3. Plumbing Recommission Guidelines: Lessons from Water Testing during COVID Building Shutdowns Andrew Whelton, Ph.D., Purdue University, West Lafayette, IN, USA	William Rhoads, Michele Provost, Andrew Whelton
Winter	January 2022 - Las Vegas/Hybrid	**Renewables and the Smart Grid** 1. Field Demonstration of Optimal Control for Campus Cooling Plant for Renewable Energy Integration and Decarbonization Donghun Kim, Ph.D., Member, Lawrence Berkeley National Laboratory, Berkeley, CA 2. Integration of Renewables and the Smart Grid Randall Higa, P.E., Member, Southern California Edison, Rosemead, CA 3. Decentralized Renewable Energy System and CO2 Expected Reductions by 2050 Samer Zawaydeh, Ph.D., Al Hussein Technical University, Amman, Jordan	Donghun Kim, Randall Higa, Samer Zawaydeh
Winter	January 2022 - Las Vegas/Hybrid	**HVAC Design, Control and Operation of Hospitals** 1. The Hospital of the Future: Designing for Energy Efficiency and Infection Control Timothy Jacoby, Scripps Health, San Diego, CA 2. Designing Flexible and Adaptable HVAC Systems Renshaw Edward, P.E., Kaiser Permanente, La Mesa, CA	Timothy Jacoby, Renshaw Edward

Winter	January 2022 - Las Vegas/Hybrid	**Would Your Building Perform Satisfactorily During a Heatwave or Power-Blackout?** 1. Strategies for Urban Cooling – How Buildings Can Improve Indoor and Outdoor Urban Climates David Sailor, Ph.D., P.E., Arizona State University, Tempe, AZ, USA 2. Could a Passive Design Satisfy the Needs of Building Occupants? Eric Peterson, Ph.D., P.E., University of Leeds, Leeds, United Kingdom	David Sailor, Eric Peterson
Winter	January 2022 - Las Vegas/Hybrid	**In Real Time: Charting the Pathway for Existing Buildings to get to Carbon Neutrality** 1. Creating an Effective Action Plan #1 Stet Sanborn, AIA, Member, Smith Group, San Francisco, CA 2. Creating an Effective Action Plan #2 Kent Peterson, P.E., Presidential Fellow ASHRAE, P2S, Inc., Long Beach, CA 3. Creating an Effective Action Plan #3 John Hickey, P.E., Jacobs, Seattle, WA 4. Creating an Effective Action Plan #4 Kiersten Washle, Associate Member, CMTA, Boston, MA	Stet Sanborn, Kent Peterson, John Hickey, Kiersten Washle
Winter	January 2022 - Las Vegas/Hybrid	**High Efficiency Variable Speed Pumping Systems and Integration Challenges with Chiller Plant Design** 1. Key Chiller Selection Criteria in a Variable Flow Pumping System Rick Heiden, Member, Trane - Ingersoll Rand, La Crosse 2. Pumps That Know the Flow in Chilled Water Pumping Systems David Lee, P.Eng., Member, Armstrong Fluid Technology, Toronto, ON, Canada 3. Lessons Learned in Control and Operation of Primary-Secondary and Distributed Pumping Chilled Water Systems Chris Miller, P.E., Member, P2S, Inc., Long Beach, CA 4. Key Design Considerations for the Implementation of Variable Primary Chilled Water Pumping Systems Brandon Gill, P.E., Member, Taylor Engineering, Alameda, CA	Rick Heiden, David Lee, Chris Miller, Brandon Gill
Winter	January 2022 - Las Vegas/Hybrid	**Design Challenges to the Electrification of Heating in Mid to Large Buildings** 1. Fundamentals and Technologies of Heating Electrification Drew Turner, Danfoss, Baltimore, MD 2. Time Independent Energy Recovery: The Solution to Large Building Electrification Brandon Gill, P.E., Member, Taylor Engineering, Alameda, CA 3. The Ins and Outs of Heat Recovery Chiller Sizing and Control Chris Miller, P.E., Member, P2S, Inc., Long Beach, CA	Drew Turner, Brandon Gill, Chris Miller
Winter	January 2022 - Las Vegas/Hybrid	**Upgrading Existing Building Control Systems for High Performance Operation** 1. Upgrading Building Control Systems for High Performance Operation across a Portfolio Dick Mink, Commonwealth of Kentucky, Frankfort, KY 2. Designing, Specifying and Managing High Performance Controls Upgrades into a Centralized System Casey Wilson, Member, CMTA, Inc., Louisville, KY 3. Verifying Control System Performance Using Data, a Digital Twin, and Easy to Understand Analytics Kevin Fuller, Interval Data Systems, Boston, MA	Dick Mink, Casey Wilson, Kevin Fuller
Winter	January 2021 - Virtual	**Hotter Cities, Hotter Climates: Modelling and Measuring Urban Heat Island Effects Around the World WITH LIVE Q & A** 1. Cooling Hot Cities: A Systematic and Critical Review of the Numerical Modelling Literature Evyatar Erell, Ph.D., Ben-Gurion University of the Negev, Beersheba, Israel 2. Case Studies of Blue and Green Mitigation of Urban Canyons Eric Peterson, Ph.D., P.E., University of Leeds, Leeds, United Kingdom	Evyatar Erell, Eric Peterson
Winter	January 2021 - Virtual	**How Will Climate Change Affect Standards, Guidelines, and the Way We Design? Part 1: Why Climate Change May Affect the Design of Buildings and Their Systems** This is Part 1 of a 3-seminar series. Part 1 will introduce the new ASHRAE Fundamentals Handbook Chapter on Climate Change with a discussion of climate change issues which are anticipated to effect changes in some standards, guidelines and, eventually, codes. It will include a review of the newest climate zone maps with zone creepage, additional climate change related information and an exploration of questions of whether it is good practice to continue using 30-year historic weather data for load calculations in view of rapid climate change.	
Winter	January 2021 - Virtual	**How Will Climate Change Affect Standards, Guidelines, and the Way We Design? Part 2: Application to Loads Calculations and Design Conditions** This seminar is Part 2 of a 3-seminar series. It will cover specific climate effects on the built environment and on loads calculations. The sessions seeks to show what areas are expected to need modification due to the changing climate and what areas do not need change. The session starts with issues specific to 90.1, looks at the effects of climate change on loads calculations, and then turns to the subject of appraising actual changes in design conditions due to climate through statistical analysis.	

Winter	January 2021 - Virtual	**How Will Climate Change Affect Standards, Guidelines, and the Way We Design? Part 3 Decarbonization by Smart Grid and Adaptation to Northern Warming** This is Part 3 of a 3-part seminar series. Part 3 looks at specific solutions and problems related to climate change. International standards concerning new building guidelines for the smart grid and their relationship to decarbonization is explored in the first presentation. The second presentation similarly explores how carbon emissions are changing with time in Minnesota and explores how the ASHRAE Smart Grid Guide can be used. The third presentation looks at warming in the Canadian north and associated adaptations that are needed.	
Annual	June 2020 - Virtual	**Battle of the Nexus: Water vs. Energy in HVAC** 1. Does Simple Always Equate to More Energy Consumption: The Elegance of Selecting Air or Water Cooled VRF Systems Chris Miller, P.E., Associate Member, P2S Inc., Long Beach, CA 2. Exploring Cooling Towers and Fluid Coolers to Achieve Water and Energy Savings Adriana Brasoava Roath, P.E., Associate Member, HGA, Minneapolis, MN 3. Potential Impact of Heat Recovery Chillers on Water and Energy Conservation Joseph Witchger, P.E., Member, HGA, Minneapolis, MN	Chris Miller, Adriana Brasoava Roath, Joseph Witchger
Annual	June 2020 - Virtual	**Zero Energy Buildings and Intelligent Controls** 1. Zero Energy Buildings in a Campus Setting James Del Monaco, P.E., Member, P2S Engineering, San Diego, CA 2. Zero Energy Buildings and Intelligent Controls Justin Mezzadri, Carrier, Charlotte, NC 3. Achieving Net Zero Energy in a Laboratory Brett Friedman, P.E., Affiliated Engineers, Inc., Madison, WI	James Del Monaco, Justin Mezzadri, Brett Friedman
Annual	June 2020 - Virtual	**Timing is Everything in the Modern Grid: Which Measures Do You Apply and When Do You Operate Them?** 1. Applying Building Load Shifting Measures Scott Hackel, P.E., Member, Slipstream, Madison, WI 2. Would You Like Some Free Electricity for Your Building? Shanti Pless, Associate Member, NREL, Golden, CO 3. Better Together: Interactions Between Energy Efficiency and Demand Response and Driving Co-Benefits Andrew Satchwell, Lawrence Berkeley National Laboratory, Berkeley, CA	Scott Hackel, Shanti Pless, Andrew Satchwell
Annual	June 2020 - Virtual	**Could Electric Energy Storage Systems Be The Answer For Zero Energy Buildings?** 1. Renewable Electric Energy Storage for Zero Energy Buildings, Introduction and Technology Overview Gaylen Atkinson, Life Member, Atkinson Electronics, Inc, Retired, Salt Lake, UT 2. Introduction to Lithium Ion Batteries Khalid Nagidi, BEAP, Member, Energy Management Consulting Group, Wantagh, NY 3. Case Study of Integrating Electric Storage with Alternative Energy in a School Svein Morner, Member, HGA, Middleton, WI	Gaylen Atkinson, Khalid Nagidi, Svein Morner
Annual	June 2020 - Virtual	**The Process for Zero Energy Multifamily Buildings: The Next ASHRAE Advanced Energy Design Guide** 1. Overview of the Advanced Energy Design Guide Series and a Look Towards the Future Tom Phoenix, P.E., BEMP and BEAP, Presidential Fellow Life Member, CPL (Clark Patterson Lee), Greensboro, NC 2. The Process of Creating the Zero Energy Multifamily Guide Paul Torcellini, Ph.D., P.E., Fellow ASHRAE, National Renewable Energy Laboratory, Golden, CO 3. Intense Interactions from Plug Loads to Envelope to Occupant Behavior Stet Sanborn, AIA, Member, Smith Group, San Francisco, CA 4. Marriage of the Envelope, Plug Loads and HVAC Selection and Design Dan Nall, P.E., BEAP and BEMP, Fellow Life Member, Daniel Nall Consulting, LLC, Princeton, NJ	Tom Phoenix, Paul Torcellini, Stet Sanborn, Dan Nall,
Annual	June 2020 - Virtual	**ASHRAE's Latest Guides to Zero Energy Design** 1. Advanced Energy Design Guides and Zero Energy Targets for K-12 Schools and Office Buildings Paul Torcellini, Ph.D., P.E., Fellow ASHRAE, National Renewable Energy Laboratory, Golden, CO 2. The New Ashrae/REHVA Guide Toward Net Zero Hospitals Francis Mills, CEng, Member, Frank Mills Consulting, Leyland, United Kingdom	Paul Torcellini, Francis Mills
Annual	June 2020 - Virtual	**Technical Consultants aren't "Designers of Record", so No E&O Insurance is Needed** Today's buildings are more complex than ever. Demands for higher performance, faster delivery and lower costs have spawned the growth of Energy Modeling, BIM development, in-field photogrammetry, Commissioning and Green consultants. These early-on consultants can have a big impact on final design decisions. Do they have professional liability similar to licensed design professionals? Should they carry PLI? If you've contracted out to consultants, have you verified their capacity to 'handle' the risks associated with the direction they provide? This debate will dig into the potentially dirty details and shifting terrain covered by tech consultants and the "responsible party."	

Winter	January 2020 - Orlando	**What Makes Orlando and Central Florida a Front-Runner in Implementing Clean Energy and Sustainability Solutions?** 1. City of Orlando Chris Castro, Director of Sustainability & Resilience, City of Orlando, Orlando, FL, US 2. Architect Lindsey Piant Perez, AIA, Southeast Sustainability Leader, DLR Group, Orlando, FL, USA 3. MEP Engineer John Chyz, P.E., CPMP, Building Performance Project Consultant, Affiliated Engineers, Newberry, FL, USA	Chris Castro, Lindsey Piant Perez, John Chyz
Winter	January 2020 - Orlando	**Watch Out for the Unforeseen When Designing Green** 1. Breathe Deeply, or Don't: Energy Conservation, Indoor Air Quality, Health and Productivity...and Legal Liability James Newman, BEAP, OPMP, Newman Consulting Group, Farmington Hills, MI, USA 2. Controlling Opportunistic Pathogen Growth While Achieving Energy and Water Conservation William J. Rhoads, Ph.D., Virginia Tech, Blacksburg, VA, USA 3. Impacts of Sustainable Design Choices on Noise Control Mandy Kachur, P.E., Soundscape Engineering, Plymouth, MI, USA 4. Considerations When Going Green with a Historic Building Janice K. Means, P.E., Lawrence Technological University, Southfield, MI, USA	James Newman, William J. Rhoads, Mandy Kachur, Janice K. Means
Annual	June 2019 - Kansas City	**The Process for Zero Energy Office Buildings: The Next ASHRAE Advanced Energy Design Guide** 1. Overview of the AEDG Series and a Look Towards the Future Tom Phoenix, P.E., CPL (Clark Patterson Lee), Greensboro, NC, USA 2. The Process of Creating the Zero Energy Office Guide Paul Torcellini, Ph.D., P.E., National Renewable Energy Laboratory, Golden, CO, USA 3. Marriage of the Envelope and HVAC Selection and Design Daniel Nall, P.E., Daniel Nall, Consultant, LLC, Princeton, NJ, USA 4. A Deep Dive into HVAC Systems for Zero Energy Buildings Ronnie Moffitt, P.E., Trane, Inc., Lexington, KY, USA	Tom Phoenix, Paul Torcellini, Daniel Nall, Ronnie Moffitt
Annual	June 2019 - Kansas City	**Energy Systems Integration and Smart Grid-Ready Buildings: All You Need to Know to Be a Good Grid Citizen** 1. Smart Grid-Ready Buildings: Enabling Tools and Solutions Glenn Remington, Consumers Energy, Jackson, MI, USA 2. Smart Grid Distribution Intelligence: Towards a Resilient, “Self-Healing” Grid Andy Haun, Schneider Electric, Andover, MA, USA 3. Integration of Renewable Energy Systems: Opportunities and Challenges Aaron Bloom, Energy Systems Integration Group, St. Paul, MN, USA	Glenn Remington, Andy Haun, Aaron Bloom
Annual	June 2019 - Kansas City	**Demystifying Cooling Tower Water Treatment** 1. Current Challenges with Cooling Towers Rafi Karim, P.E., Affiliated Engineers, Inc., Pasadena, CA, USA 2. Alternative Water Treatment Systems Jesse Dean, National Renewable Energy Laboratory, Golden, CO, USA 3. Chemical Free Water Treatment Michael Deru, Ph.D., NREL, Golden, CO, USA	Rafi Karim, Jesse Dean, Michael Deru
Winter	January 2019 - Atlanta	**How ASHRAE Standard 100 can be Applied to Atlanta's Building Energy and Water Efficiency Ordinance** 1. How to Use ASHRAE Standard 100 and Seek Compliance Curtis Fong, Taylor Engineering, Alameda, CA, USA 2. Atlanta's Building Energy and Water Efficiency Ordinance Megan O'Neil, City of Atlanta, Atlanta, GA, USA	Curtis Fong, Megan O'Neil
Winter	January 2019 - Atlanta	**Climate Change Liability for Owners, Designers and Manufacturers** 1. US National Climate Assessment Kenneth Kunkel, Ph.D., NOAA, North Carolina Institute for Climate Studies, Asheville, NC, USA 2. ASHRAE TC4.2 Climatic Information Uncertainties: Historic Vs Projected Data Drury Crawley, Ph.D., Bentley Systems, Inc., Washington, DC, USA 3. Climate Change Liability Kevin Haroff, Esq,, J.D., Marten Law, San Francisco, CA, USA 4. Safeguarding Assets for a Robust and Relevant Practice Ann Kosmal, F.A.I.A., LEED AP BD +C, CPHC, PDC, U.S. General Services Administration, Washington, DC, USA	Kenneth Kunkel, Drury Crawley, Kevin Haroff, Ann Kosmal

Annual	June 2018 - Houston	**Expanding Our Perceptions of Building Performance: Updating Standard 105** Standard 105 which provides a method of building energy performance determination, expression and comparison was last revised in 2014. The expanding use of energy benchmarking in many parts of the country reflects the increasing awareness of the impacts of building performance on the environment. There is also growing concern about the impact of buildings on water consumption. Guidance with evaluating these impacts is important to many designs as well as potential legislation. Feedback from the industry on the current standard will help TC 7.6 begin the process of reviewing, updating or expanding this standard.	
Annual	June 2018 - Houston	**Comparing the Energy, Emissions and Economic Impacts of Buildings in Energy Performance Calculations** This seminar describes a new way to evaluate performance based on relative valuation of metrics related to energy use, greenhouse gas emissions and cost (EEE) impacts. Application and benefits of the EEE impacts approach in ASHRAE standards and other initiatives are discussed.	
Annual	June 2018 - Houston	**New ASHRAE Hot Climate Design Guide** 1. The New ASHRAE Hot Climate Design Guide Frank Mills, CEng, Life Member, Frank Mills Consulting, Leyland, United Kingdom 2. Low Energy Cooling Techniques in Hot Climates Including External Melvin G Glass, Member, EMC Engineers, El Paso, TX	Frank Mills, Melvin G Glass
Annual	June 2018 - Houston	**Beneficial Carbon Reduction Strategies: Cogeneration, Electrification and Consumer Options** 1. Getting to Zero Carbon: Distributed Energy Source Strategies and Options Jim Edelson, Member, New Building Institute, Vancouver, WA 2. Electrification, Cogeneration and Emissions Efficiency David Farnsworth, Regulatory Assistance Project, Montpelier, VT 3. Retaining Worthy Consumer Options for Carbon Reduction Neil Leslie, Member, Gas Technology Institute, Des Plaines, IL	Jim Edelson, David Farnsworth, Neil Leslie,
Winter	January 2018 - Chicago	**Real-World Experience Providing Residential Energy Excellence** 1. Five New Multifamily Residential Buildings: Measured Vs. Modeled Energy Consumption Katrin Klingenberg, Passive House Institute US | PHIUS, Urbana, IL 2. Prescriptive Doesn't Work for Buildings so Why Would It Work for a Project Team? Kimberly LLewellyn, Mitsubishi Electric Cooling & Heating, Suwanee, GA 3. The U.S. Army Experience: Reducing Energy When Occupants Don't Pay for Utilities Katherine Hammack, Fellow Member, Ernst & Young, McLean, VA	Katrin Klingenberg, Kimberly LLewellyn, Katherine Hammack
Winter	January 2018 - Chicago	**The Art and Science of Delivering Healthy, Productive and Effective Buildings** 1. The Art of High Performance Buildings Peter Wong, CEng, Member, Yook Tong Electric Co Ltd, Hong Kong, Hong Kong 2. Creating Healthy Emergency Rooms for Staff and Patients David Clark, CEng, Member, Stantec, Toronto, ON, Canada 3. Retrofitting to Net Zero Energy Kevin Hydes, P.E., Integral Group, Oakland, CA 4. High Performance Buildings Require High Performance Commissioning David Green, CEng, CPMP, Member, CDML, Edmonton, AB, Canada	Peter Wong, David Clark, Kevin Hydes, David Green
Winter	January 2018 - Chicago	**The Process for Zero Energy K-12 Schools: The Next Series of ASHRAE Advanced Energy Design Guides** 1. The Process of Creating Zero Energy Design Guidance: The Next in the Series Paul Torcellini, Ph.D., P.E., Member, NREL, Golden, CO 2. The Owners Perspective: Making Zero Energy Happen John Chadwick, AIA, Arlington Public Schools, Arlington, VA 3. Lighting Design Parameters for Successful Zero Energy Schools Shanna Olson, IMEG Corp., Chicago, IL 4. Making It All Work: Important Aspects of HVAC Zero Energy Design Daniel Nall, P.E., HBDP, CPMP and BEMP, Fellow Life Member, Syska Hennessy, New York, NY	Paul Torcellini, John Chadwick, Shanna Olson, Daniel Nall
Annual	June 2017 - Long Beach	**Are We Afraid of What We'll Find? Using Real Buildings to Improve ASHRAE Standards and Publications** 1. Potential New Research on the Actual Energy Performance of Buildings Designed to Comply with ASHRAE Standard 90.1-2010 J. Kevin Cross, P.E., Member, Honeywell, Fort Collins, CO 2. Highlights of 1627-RP: Actual Energy Performance of Small Office and K-12 School Buildings Designed to Meet the 30% ASHRAE Advanced Energy Design Guides Dennis Jones, P.E., Member, Group14 Engineering Inc., Denver, CO	J. Kevin Cross, Dennis Jones

Annual	June 2017 - Long Beach	**NZEB from Foundation to Financing: Nonresidential Buildings** 1. Introduction to Solar Electric Design and Installation Khalid Nagidi, BEAP, Member, Energy Management Consulting Group, Wantagh, NY 2. Photovoltaic (PV) Systems Impact on Electric Demand Svein Olav Morner, Ph.D., P.E., CPMP, Member, Sustainable Engineering Group, Madison, WI 3. Financing and Ownership Alternatives for Large Scale Solar PV Projects James Leidel, Member, Oakland University, Rochester, MI 4. Deep Energy Refurbishment of Historic and Heritage Buildings to Reach NZEB Status Marija Todorovic, Ph.D., P.E., Fellow ASHRAE, University of Belgrade, VEA-INVI.Ltd Director, Belgrade, Serbia	Khalid Nagidi, Svein Olav Morner, James Leidel, Marija Todorovic
Annual	June 2017 - Long Beach	**Those Who Cannot Remember the Past are Condemned to Repeat It: Modeling, Performance and Lessons Learned from Installation of Solar Energy Systems** 1. Learning from History: Lesson Learned over 35 Years of Solar Energy at Fort Huachuca, AZ William Stein, US Army Corps of Engineers, Champaign, IL 2. Solar Thermal Sizing, Modeling and Verification for an Army Barracks Jay Tulley, U.S. Army Garrison, Monterey, CA 3. Solar Community Heating and Cooling System with Central Heat Pump and Geo-Exchange System for Cold Climates Farzin Masoumi, Member, Union Gas Limited, Toronto, ON, Canada	William Stein, Jay Tulley, Farzin Masoumi
Annual	June 2017 - Long Beach	**The Essential Ingredient for High Performance Green Homes** 1. Feedback Tools for Designing and Implementing Comfortable Efficient Homes Dan Perunko, Balance Point Home Performance, Nevada City, CA 2. Which Should Come First in Housing, Energy Efficiency or Thermal Comfort? Robert Bean, Member, Indoor Climate Consultants Inc., Calgary, AB, Canada 3. The Energy and Environmental Benefits of Design Choices that Provide Excellent Comfort Chris Mathis, Member, Mathis Consulting, Montreal, AL	Dan Perunko, Robert Bean, Chris Mathis
Annual	June 2017 - Long Beach	**Flooding: Superstorm Sandy: Lessons Learned & Strategies Implemented** 1. Superstorm Sandy: Lessons Learned Chris Colasanti, P.E., Member, Jaros Baum & Bolles, New York, NY 2. Superstorm Sandy: New Codes & Design Considerations Scott Sherwood, Member, Eco Care Corp., Bronx, NY 3. Life Safety Issues That Occurred at NYU Medical during and in the Aftermath of Superstorm Sandy Richard Cohen, NYU Langone Medical Center, New York, NY 4. Climatic Information: History & Current Data & Trending William McQuade, Member, Johnson Controls, Inc., York, PA	Chris Colasanti, Scott Sherwood, Richard Cohen, William McQuade
Annual	June 2017 - Long Beach	**Best Practices For Low Energy Residential Buildings Across the Globe** ASHRAE Associate Society Alliance (AASA) has members from over 50 global HVAC&R societies. AASA also has a large representation from Developing Countries where due to rapid urbanization, the demand for homes is growing exponentially (India alone will add 50 billion sq. ft. of constructed space in next two decades). The Forum discusses the case studies and best practices followed in design of cost effective homes. This Forum has international flavor with representatives from more than 20 countries and provides an opportunity to the attendees to interact & learn from each other.	
Annual	June 2017 - Long Beach	**Designs and Policies for Affordable Zero Net Energy Homes and Sustainable Communities** 1. Affordable Zero Net Energy Home Design Strategies Mike Huber, Habitat for Humanity of San Joaquin County, Inc., Stockton, CA 2. Challenges and Opportunities in the Design of Sustainable Communities Judi Schweitzer, Schweitzer and Associates, Lake Forest, CA 3. Zero Net Energy Policies: Opportunities and Challenges in California Michelle Sim, SoCalGas, Los Angeles, CA	Mike Huber, Judi Schweitzer, Michelle Sim
Annual	June 2017 - Long Beach	**Zero Energy Healthcare Buildings: Current Status and Future Efforts** 1. Toward NZE Hospitals in North America Heather Burpee, University of Washington Integrated Design Lab, Seattle, WA 2. Owner Perspective on Potential for NZE Healthcare Facilities Travis English, P.E., Member, Kaiser Permanente, Anaheim, CA 3. European Research Study into NZE Hospitals Hans Besselink, Member, HaskoningDHV Nederland B.V., Rotterdam, Netherlands 4. Strategies for NZE Hospitals in the UK Francis Mills, CEng, Life Member, Frank Mills Consulting, Leyland, United Kingdom	Heather Burpee, Travis English, Hans Besselink, Francis Mills
Annual	June 2017 - Long Beach	**WORKSHOP 9: How to Design, Construct and Operate Net Zero Hospitals AND Save Money** 1. How to Achieve Net Zero Energy Hospitals Wim Maassen, Royal Haskoning DHV, Rotterdam, Netherlands 2. Strategies to Net Zero Hospitals Frank Mills, Member, Low Carbon Design Consultants, Liverpool, United Kingdom	Wim Maassen, Frank Mills,