ASHRAE ASHRAE | Tools for Designing
High Performance Buildings
ENERGY MODELING CONFERENCE | Sept. 30–Oct. 2, 2015

2015 ASHRAE Energy Modeling Conference
September 30-October 2, 2015
Atlanta Marriott Buckhead Hotel
Atlanta, GA

Technical Program (9-23-15)

Platinum Sponsors:

Gold Sponsors:

Sponsor Plus Sponsors:

Sponsors:

Endorsing Organization: IBPSA-USA

Parking

Discounted parking is available for all conference attendees. For attendees staying at the Marriott Buckhead, use the self-parking attached to the building and tell the front desk that you parked your car. The front desk will add $12 per day to your bill (overnight parking).

For attendees not staying at the Marriott Buckhead, park in the self-parking lot. At the ASHRAE registration desk, ask for a self-parking voucher each day to receive a discounted rate of $7 per day.

Self-parking levels are P2, P3 and P4 and the regular valet charge is $20 for day and $32 overnight.

WiFi

Complimentary WiFi is available in the meeting rooms beginning on Wed., Sept. 30. Please only connect with one device. We have a limited number of connections available.

Network: Marriott Conference
Passcode: AJZZAXJU

If you are staying at the Atlanta Marriott Buckhead and booked your room through the conference room block, complimentary internet is also available in your room. Please check with the front desk for more information.

Wednesday, September 30

Wednesday, September 30, 7:30 AM-8:00 AM

VENDOR DEMONSTRATIONS

DesignBuilder USA

Room: Heritage Ballroom C

Wednesday, September 30, 8:15 AM-9:00 AM

KEYNOTE

Dr. Story Musgrave Keynote Speech

Room: Heritage Ballroom B

Chair: Dennis Knight, P.E., BEMP, Member, Whole Building Systems, LLC, Charleston, SC

Dr. Story Musgrave is an American physician and retired NASA astronaut. He is a public speaker and consultant to both Disney's Imagineering group and Applied Minds in California. Dr. Musgrave was an NASA astronaut for over 30 years and flew on six spaceflights. He performed the first shuttle spacewalk on Challenger's first flight, was a pilot on an astronomy mission, conducted two classified DOD missions, was the lead spacewalker on the Hubble Telescope repair mission and on his last flight, he operated an electronic chip manufacturing satellite on Columbia.

Wednesday, September 30, 9:15 AM-10:45 AM

SEMINAR 1 (INTERMEDIATE)

Modeling Techniques 1

Room: Heritage Ballroom B

Chair: James V. Dirkes II, P.E., BEMP, Member, The Building Performance Team Inc., Grand Rapids, MI

This session covers a range of modeling techniques. The first presentation covers how to do infiltration better and a new OpenStudio Measure. The second presentation discusses creating a building model using your digital camera, providing an overview of LiDAR and photogrammetry technologies. The third presentation covers modeling complex geometries in whole building energy simulations. The fourth presentation on parametric modeling discusses integrating templates and scripting to create a highly efficient workflow to automatically generate building energy models for parametric analysis.

1. How to Do Infiltration Better: The New OpenStudio Measure
Lisa Ng, Ph.D., Member[1], Brian Polidoro[1] and Steven Emmerich, Member[1], (1)National Institute of Standards and Technology, Gaithersburg, MD

1. Creating a Building Model Using Your Digital Camera
Drury Crawley, Ph.D., BEMP, Fellow ASHRAE, Bentley Systems, Inc, Washington, DC

2. Modeling Complex Geometries in Whole Building Energy Simulations
Cheryl Saldanha, P.E.[1], Arfa Aijazi[2] and Sean O'Brien, P.E., Member[1], (1)Simpson Gumpertz & Heger, New York, NY, (2)Simpson Gumpertz & Heger, Washington, DC

4. Parametric Modeling with Templates and Scripting
Peter Ellis, Member, Big Ladder Software, Denver, CO

Wednesday, September 30, 9:15 AM-10:45 AM

SEMINAR 2 (INTERMEDIATE)

Conceptual Design

Room: Buckhead A

Chair: Drury Crawley, Ph.D., BEMP, Fellow ASHRAE, Bentley Systems, Inc, Washington, DC

This session addresses conceptual design. It includes presentations that focus on the collaboration process to allow architects to create high performance and interesting building designs. Presentations also discuss the tools available for energy programming, which inform space planners and programmers of sustainability impacts. Other presentations cover topics like an EnergyPlus-based workflow that leverages third-party and custom tools as well as determining what passive design strategies have the most impact on building energy consumption and daylight potential.

1. Applying Building Performance Simulation in Early Design at an Architecture Firm
Eddy Santosa, Callison, Seattle, WA

2. Early Energy Analysis: Performance at the Programming Phase
Vikram Sami, AIA, BEMP, Member[1] and Amy Jarvis, P.E., Member[2], (1)ZGF Architects LLP, Seattle, WA, (2)ZGF Architects LLP, Portland, WA

3. Have Confidence in Your Early Concept Models: a Custom E+ Workflow That Works
Christian Cianfrone, P.Eng., BEMP, Member, Morrison Hershfield, Vancouver, BC, Canada

4. Methodology and Tools for Architects to Make Energy and Daylight Performance-Related Decisions in the Conceptual Building Design Phase
Sravanthi Musunuru, Student Member, University of Minnesota, Twin Cities, Minneapolis, MA

Wednesday, September 30, 11:15 AM-12:15 PM

SEMINAR 3 (INTERMEDIATE)

Modeling Workflow 1

Room: Heritage Ballroom B

Chair: Dennis Knight, P.E., BEMP, Member, Whole Building Systems, LLC, Charleston, SC

This session on modeling workflow consists of three presentations. The first showcases several visualizations beyond simple line and bar charts that help modelers understand how an energy model is working (or figure out why it isn't). The next presentation provides a method to interpret data and establish general criteria of intervention in order to translate the complexity of the environment conditions into richness of design. The third presentation focuses on the quality control tests that were developed to verify the energy modeling inputs acquired by RapMod by verifying them against the inputs collected by engineers during a walk-through.

1. A Picture Is Worth 1,000 Inputs: Energy Model Visualization Beyond Bar Charts
Andrew Parker, NREL, Golden, CO

2. BIM Methodology for Facade Retrofitting Tailored Design: A Case Study in Rome, Italy
Marika Prete[1] and Alberto Raimondi Sr., Ph.D.[1], (1)Department of Architecture, Universita di Roma Tre, Roma, Italy

3. Quality Control for Energy Modeling Workflow When Simulation Inputs Are Acquired through Non-Traditional Approaches
Annie Marston, Ph.D., BEMP, Ebert and Baumann Consulting Engineers Inc., Washington, DC

Wednesday, September 30, 11:15 AM-12:15 PM

SEMINAR 4 (BASIC)

Business Cases for BIM and BEM

Room: Buckhead A

Chair: Susan Collins, Whole Building Systems, Charleston, SC

This session covers building information modeling and building energy modeling in business cases. The presentations demonstrate an approach for communicating the benefits of energy models in nontechnical language to financial and planning decision-makers in a manner that engages them and helps them compete effectively with other financial priorities. The session also explains the base elements of building information modeling and how to alter the work process to take advantage of these tools. The role of traditional documentation process versus modeling and how to plan and budget for the changes are also presented.

1. The Business Case for Energy Models
James Dirkes II, P.E., BEMP, Member, The Building Performance Team Inc, Grand Rapids, MI

2. Being Successful in the Business of BIM
David Butts, Gannett Fleming, Raleigh, NC

Wednesday, September 30, 1:00 PM-1:30 PM

VENDOR DEMONSTRATIONS

Cradle North America, Inc.

Room: Heritage Ballroom C

Wednesday, September 30, 1:45 PM-3:00 PM

SEMINAR 5 (INTERMEDIATE)

All About the Weather

Room: Heritage Ballroom B

Chair: Mohammad Heidarinejad, University of Maryland, College Park, MD

   This session offers presentations that cover the impact of climate change on buildings' energy performance. They also discuss how the climatic response of a building would be better served by a range of building climatic data, such as high and low cases of temperature, humidity, solar radiation and wind conditions and propose a methodology for defining eXtreme meteorological years (XMYs). This session also reviews a free, open-source and cross-platform Elements weather file application, designed to consolidate the tasks required to browse and process weather data files into one convenient tool and explore the motivation and design of the software.

1. Climate Variation Sensitivity in Building Energy Simulation
Nathan Kegel, Associate Member[1] and Sean Daigneault[2], (1)Integrated Environmental Solutions, Plymouth, MN, (2)Weather Analytics, Bethesda, MD

2. Does the 'Typical' Meteorological Year Makes Sense Any More for Building Simulation?
Drury Crawley, Ph.D., BEMP, Fellow ASHRAE, Bentley Systems, Inc, Washington, DC

3. Elements: a Weather File Viewer/Editor/Processor
Michael O'Keefe, Big Ladder Software, Denver, CO

Wednesday, September 30, 1:45 PM-3:00 PM

SEMINAR 6 (ADVANCED)

Daylighting

Room: Buckhead A

Chair: Mrigesh Roy, Student Member, Arizona State University, Tempe, AZ

   The presentations in this session cover aspects of daylighting research and simulation. The session discusses the challenges of integrated daylighting simulation and the software architecture in OpenStudio that allows such simulations to be performed. Speakers also demonstrate daylighting objectives by reviewing analysis tools, performance metrics and the synthesis of qualitative and quantitative information as crucial to daylighting assessments.

1. A Comparative Study of Spatial Daylit Area Drawings with Annual Climate-Based Simulation Using Multiple Manual Blind Control Patterns and Point in Time Simulation
Amir Nezamdoost[1] and Kevin Van Den Wymelenberg[1], (1)Integrated Design Lab - University of Idaho, Boise, ID

2. Daylighting in the BEM Workflow: Giving Daylight Its Due
Rob Guglielmetti, National Renewable Energy Laboratory, Golden, CO

3. Delivering Daylight: Process and Product of Natural Lighting Analysis
Zahraa Saiyed, Affiliate[1] and Cheryl Saldanha, P.E.[2], (1)Simpson Gumpertz & Heger, San Francisco, CA, (2)Simpson Gumpertz & Heger, New York, NY

Wednesday, September 30, 3:30 PM-5:00 PM

SEMINAR 7 (BASIC)

Code Compliance

Room: Heritage Ballroom B

Chair: Krishnan Gowri, Ph.D., Member, Autodesk, Inc., San Francisco, CA

The importance of preparing design professionals to meet the challenges of designing high performance buildings is discussed in this session. Speakers introduce key software inputs, simulation workflow and examples of design cases for code compliance and discuss implementation challenges and suggested improvements to the Building Envelope Trade-Off Option in the future. This session also provides an overview of the overall hierarchy and working of the CBECC-Com tool, as well as the Performance Rating Method Ruleset Manual. It also discusses why high performance design and code energy modeling should be separate professions.

1. Preparing Design Professionals to Meet Building Performance Demands
Kamaria Greenfield, Building Codes Assistance Project, Washington, DC

2. Simulation-Based Code Compliance in Comcheck for Building Envelope
Jian Zhang, Ph.D., Member[1], Robert W. Schultz[1], Rosemarie Bartlett[1] and Bing Liu[1], (1)Pacific Northwest National Laboratory, Richland, WA

3. Using Cbecc-Com for Automating the Performance Rating Method of ASHRAE Standard 90.1-2010
Supriya Goel[1] and Michael Rosenberg[1], (1)Pacific Northwest National Laboratory, Richland, WA

4. Why High Performance Design and Code Energy Modeling Should be Separate Professions
Andrew Corney, P.E., Member, Sefaira, London, United Kingdom

Wednesday, September 30, 3:30 PM-5:00 PM

SEMINAR 8 (INTERMEDIATE)

Thermal Comfort

Room: Buckhead A

Chair: Yanfei Li, Student Member, The University of Alabama, Tuscaloosa, AL

   This session examines various factors related to thermal comfort, such as airflow and thermal comfort in an educational building and their effects on productivity. It also discusses some of the problems associated with the simulation of occupant comfort in non-uniform spaces with different conditioning systems and provides solutions and suggestions on how to evaluate comfort simulation results. Presentations in this session also evaluate occupant comfort in naturally ventilated high rise buildings, as well as investigate whether the use of floor multipliers has a significant impact on the results of building energy simulation.

1. Air Flow and Thermal Comfort in an Educational Building
Emilia Targonska[1], Mahroo M. Eftekhari, Ph.D., Member[2] and Faisal Durrani, Ph.D.[2], (1)Loughborough University, London, United Kingdom, (2)Loughborough University, Loughborough, United Kingdom

2. Analysis of Occupant Thermal Comfort in Non-Uniform Spaces
Peter Simmonds, Ph.D., Fellow ASHRAE, Building and Systems Analytics LLC, Marina Del Rey, CA

3. Evaluating Occupant Comfort in Naturally Ventilated High Rise Buildings
Peter Simmonds, Ph.D., Fellow ASHRAE, Building and Systems Analytics LLC, Marina Del Rey, CA

4. Intelligent Simplification: Consequences of Grouping Floors with Identical Thermal Blocks
Megan Tosh, P.E., Member[1] and Nathan Kegel, Associate Member[1], (1)Integrated Environmental Solutions, Plymouth, MN

Wednesday, September 30, 5:00 PM-5:30 PM

VENDOR DEMONSTRATIONS

Trane

Room: Heritage Ballroom C

Thursday, October 1

Thursday, October 1, 7:30 AM-8:00 AM

VENDOR DEMONSTRATIONS

Autodesk

Room: Heritage Ballroom C

Thursday, October 1, 8:15 AM-8:45 AM

KEYNOTE

Energy Modeling Uncertainty and Quality Assurance: An Ignite Session

Room: Heritage Ballroom B

Chair: Dennis Knight, P.E., BEMP, Member, Whole Building Systems, LLC, Charleston, SC

Energy modeling is widely used in all stages of the design process and often all the details needed for modeling are not always available. Energy modelers and software tools make reasonable assumptions for everything from weather data and material properties to occupancy schedules and equipment performance. All this leads to uncertainty of the simulation results and it poses a huge challenge to assure stakeholders of the energy performance. At core of this issue is the need for an industry-wide strategy to establish a modeling quality assurance program for ensuring accuracy and reliability of energy models. The session leaders ignite the discussion with their initial thoughts and attendees are encouraged to participate with position statements that can be voted on by the audience.

Energy Modeling Uncertainty and Quality Assurance, Part 1
Dennis Knight, P.E., BEMP, Member, Whole Building Systems, LLC, Charleston, SC

Energy Modeling Uncertainty and Quality Assurance, Part 2
Krishnan Gowri, Ph.D., Member, Autodesk, Inc., San Francisco, CA

Thursday, October 1, 9:00 AM-10:30 AM

SEMINAR 9 (INTERMEDIATE)

Modeling Techniques 2

Room: Heritage Ballroom B

Chair: James V. Dirkes II, P.E., BEMP, Member, The Building Performance Team Inc., Grand Rapids, MI

This session addresses new strategies that are used to incorporate airflow calculations into building energy calculations and are now automated through a new OpenStudio Measure. Presentations introduce the concept of scripts, give examples of publicly available scripts and describe other scripts, which reduce run time, automate repetitive tasks and improve quality control. This session presents methods for reducing plug loads and taking credit for these reductions in the energy modeling workflow and introduces a new approach to calculating foundation heat transfer that is easy to use, highly accurate and very fast.

2. Leveraging OpenStudio Scripts to Reduce Modeling Time
Taylor Roberts, Associate Member, Group14, Denver, CO

3. Modeling Plug Load Savings
Charles Eley, P.E., BEMP, Member, Eley Consulting, San Francisco, CA

4. When Is It Important to Model Foundation Heat Transfer Accurately?
Neal Kruis, Ph.D., Student Member, Big Ladder Software, Denver, CO

Thursday, October 1, 9:00 AM-10:30 AM

SEMINAR 10 (BASIC)

Incentive Programs

Room: Buckhead A

Chair: Sravanthi Musunuru, Student Member, University of Minnesota, Twin Cities, Minneapolis, MA

This session explores the challenges of implementing energy efficiency measures from the perspectives of utilities and energy modelers. It includes detailed discussions on a fundamental paradigm shift related to energy modeling that puts more emphasis on the verification process through inverse or quasi-inverse modeling. One presentation covers agent-based modeling (ABM) and demonstrates the power of Commercial Building Agent Model, an ABM with both a commercial and residential building stock (and corresponding energy model prototypes) developed. Another presentation focuses on detailing a comprehensive business model to evaluate the return on investment from running onsite generators in commercial buildings in the UK.

1. Energy Modeling for Utility and Public Funded Programs
Alamelu Brooks, BEAP and HBDP[1], Haider Khan[2] and O'Neil Morgan[3], (1)ICF International, Columbia, MD, (2)ICF International, Toronto, ON, Canada, (3)ICF International, Columbia, SC

2. Marketplace Exploration and Market Potential Evaluation of Energy Efficient Technologies Using Agent Based Modeling
Joshua Bergerson, Ph.D., Affiliate[1] *and Ralph Muehleisen, Ph.D., P.E., Member*[1], *(1)Argonne National Laboratory, Lemont, IL*

3. Modelling the Business Case to Run on-Site Generators in UK Commercial Buildings through Real-Time Electricity Pricing
Salvador Acha, Ph.D., Associate Member[1], *Gonzalo Bustos, P.Eng.*[1] *and Nilay Shah, Ph.D.*[1], *(1)Imperial College London, London, United Kingdom*

Thursday, October 1, 10:45 AM-12:00 PM

SEMINAR 11 (INTERMEDIATE)

Optimization

Room: Heritage Ballroom B

Chair: Carrie A. Brown, Ph.D., Associate Member, Resource Refocus LLC, Menlo Park, CA

This session discusses optimization and cost analysis. The first presentation in this session covers an "Optimized Life-Cycle Cost Analysis", created in a tool using the Apidae cloud-based suite, and used to optimize certain building envelope constructions. Another presentation describes an innovative design approach using multicriteria cost-benefit analysis (optimization) tools fully integrated within DesignBuilder EnergyPlus simulation software. The final presentation introduces an integrated framework for building information modeling-based multidisciplinary performance optimization.

1. Optimized Life-Cycle Cost Analysis (LCCA)
Richard Ellison, P.E., HBDP, BEMP and BEAP, Member[1] *and David Bosworth, Member*[2], *(1)Energy Engineer, Thurmont, MD, (2)BuildLab, Dryden, NY*

2. Using Optimization in Simulation Tools to Minimize the Energy Consumption and Life Cycle Costs in Building Construction and Refurbishment Projects
David Cocking, CEng, DesignBuilder Software Ltd, Stroud, United Kingdom

3. BIM-Based Building Performance Multidisciplinary Optimization
Mohammad Rahmani Asl, Ph.D., Student Member[1] *and Wei Yan, Ph.D.*[1], *(1)Texas A&M University, College Station, TX*

Thursday, October 1, 10:45 AM-12:00 PM

SEMINAR 12 (INTERMEDIATE)

HVAC Systems Modeling

Room: Buckhead A

Chair: Mohammad Heidarinejad, University of Maryland, College Park, MD

The first presentation in this session discusses how mobile applications are changing the way HVAC technicians, maintenance managers and building energy auditors do their jobs. The next presentation addresses the experience and learning that is derived from using EnergyPlus as an equipment sizing tool. It discusses the strengths and weaknesses of using EnergyPlus as a dedicated sizing software. This session also examines different waste heat reclaim systems, provides spreadsheet modeling tools and methods to evaluate their energy impacts and provides sample results across ASHRAE climate zones.

1. How Mobile Apps Are Revolutionizing Field-Based HVAC Load Calculations and Building Energy Audits
Stephen Roth, P.E., Member, Carmel Software Corp, San Rafael, CA

2. Adapting EnergyPlus for HVAC Sizing
Vladimir Bajic[1], Ritwik Raj, Ph.D.[1] and Andrew Corney, P.E., Member[2], (1)Sefaira, New York, NY, (2)Sefaira, London, United Kingdom

3. Refrigeration Playbook: Heat Reclaim
Tim Johnson, P.E., BEMP, Associate Member[1], Eric Nelson, P.E., Associate Member[1], James Armer, P.E., Member[1], Chuck Reis II[1], Adam Hirsch, Ph.D., Member[2] and Ian Doebber, Associate Member[2], (1)CTA Architects Engineers, Boise, ID, (2)NREL, Golden, CO

Thursday, October 1, 1:00 PM-1:30 PM

VENDOR DEMONSTRATIONS

Integrated Environmental Solutions

Room: Heritage Ballroom C

Thursday, October 1, 1:30 PM-5:00 PM
LowDown Showdown

Room: Heritage Ballroom B

Chair: Dennis Knight, P.E., BEMP, Member, Whole Building Systems, LLC, Charleston, SC

   New to the ASHRAE Energy Modeling Conference is the ASHRAE LowDown Showdown modeling challenge sponsored by the Department of Energy (DOE) and the National Renewable Energy Laboratory (NREL). The ASHRAE LowDown Showdown showcases the work of several teams competing to model a net zero or below building. The purpose is to give conference attendees the opportunity to work with the vendor/developer of their choice to showcase their abilities using the vendor's simulation tools, innovative workflows and creative problem solving to model a high performance building while having fun. Attendees will have the opportunity to vote for the best model.

1:30 PM-1:45 PM

Autodesk
Stephanie Egger, Autodesk, San Francisco, CA

1:45 PM-2:00 PM

Carrier HAP
James Pegues, Carrier, East Syracuse, NY

2:00 PM-2:15 PM

DesignBuilder
David Cocking, CEng, DesignBuilder Software Ltd, Stroud, United Kingdom

2:15 PM-2:30 PM

EnergyPlus
Christian Cianfrone, P.Eng., BEMP, Member, Morrison Hershfield, Vancouver, BC, Canada

2:30 PM-2:45 PM

eQUEST
Nick Caton, Caton Energy Consulting, Shoreline, WA

2:45 PM-3:00 PM

IES
Liam Buckley, Member, IES Ltd., Boston, MA

3:00 PM-3:15 PM

Sefaira
Andrew Corney, P.E., Member, Sefaira, London, United Kingdom

3:15 PM-3:30 PM

Trane TRACE
Matt Biesterveld, Trane, La Crosse, WI

3:30 PM-4:00 PM

Break

4:00 PM-5:00 PM

Q&A Session

Thursday, October 1, 5:00 PM-5:30 PM

VENDOR DEMONSTRATIONS

BUILDLab LLC

Room: Heritage Ballroom C

Friday, October 2

Friday, October 2, 7:30 AM-8:00 AM

VENDOR DEMONSTRATIONS

Sefaira

Room: Heritage Ballroom C

Friday, October 2, 8:15 AM-10:00 AM

SEMINAR 13 (ADVANCED)

Calibration, Measurement and Validation

Room: Heritage Ballroom B

Chair: Mariah Schwartz, Whole Building Systems, LLC, Charleston, SC

This session discusses and summarizes the challenges of modeling recent residential net zero energy projects due to new technologies. It includes projects designed to identify the potential benefits of using energy modeling as a means of performance assessment to help energy models closely match predicted savings. Also, it shares the findings of a recent measurement and verification (M&V) study that used calibrated energy modeling to analyze the in-service energy consumption of nine high performance buildings. The session covers a case study under which a major public university sought significant facility upgrades in its highest energy usage research laboratories.

1. California Net Zero Energy Residential Buildings: Modeled vs. Measured Performance
Carrie A. Brown, Ph.D., Associate Member, Resource Refocus LLC, Menlo Park, CA

2. Identification of Potential Benefits of Using Energy Modeling By Comparing Two Campus Buildings
Ok-Youn Yu, Ph.D., P.E.[1] and Chelsea Davis[1], (1)Appalachian State University, Boone, NC

3. Measurement and Verification through Calibrated Energy Modeling of High Performance Buildings
Amy Montgomery, Affiliate[1] and Brittany Hanam, P.Eng., Associate Member[2], (1)RDH Building Engineering, Victoria, BC, Canada, (2)RDH Building Engineering Ltd., Vancouver, BC, Canada

4. Validation of University Laboratory HVAC Upgrades By Energy Analysis
Thomas Vu, P.E., Member[1] and Scott Parker, P.E., Member[1], (1)Affiliated Engineers, Inc., Chapel Hill, NC

Friday, October 2, 8:15 AM-10:00 AM

SEMINAR 14 (ADVANCED)

Parametric Modeling for Design

Room: Buckhead A

Chair: James V. Dirkes II, P.E., BEMP, Member, The Building Performance Team Inc., Grand Rapids, MI

   This session includes unique case studies that expose the limitations of energy modeling software as well as discuss how modeling accuracy was achieved despite the limitations. The next presentation in the session discusses a building performance study done on semiburied dwellings using existing performance simulation tools. The session also details an iterative passive design process implemented to develop a 'Passive Strategy Menu' for schools across the 16 ASHRAE climate zones in the U.S.

1. Energy Analysis of Specialized Cooling Systems in Advanced Facilities
Peter Czerwinski, P.E.[1], Michael Hill, P.Eng.[2] and Bryce Cox, P.E., Member[3], (1)CH2M HILL, Pittsburgh, PA, (2)CH2M HILL, Toronto, ON, Canada, (3)CH2M HILL, Corvallis, OR

2. Quantifying Passive School Design Strategies for the 21st Century in 16 Climate Zones
Shona O Dea, Associate Member[1] and Nathan Kegel, Associate Member[2], (1)DLR Group, Chicago, IL, (2)Integrated Environmental Solutions, Plymouth, MN

3. Understanding Underground: A Journey through Simulations
Alfonso E. Hernandez, Kirksey Architecture, Houston, TX

Friday, October 2, 10:30 AM-12:00 PM

SEMINAR 15 (INTERMEDIATE)

Modeling Workflow 2

Room: Heritage Ballroom B

Chair: Dennis Knight, P.E., BEMP, Member, Whole Building Systems, LLC, Charleston, SC

   This session examines the use of complex systems to reduce consumption while maintaining the necessary interior conditions to achieve energy savings. Participants in this session learn the differences between 1D, 2D and 3D assessments of a standard wall assembly and how to quantify the difference in heat flow between each analysis. It also explores using EnergyPlus for critical building analysis where the mechanical system operation costs are not the primary reason for simulation. Attendees learn more about the complex load analysis capabilities of EnergyPlus and how they can be leveraged for unique design analysis challenges.

1. Energy Modeling of Complex Laboratory HVAC Systems Using Energyplus
Harshul Singhal[1] and John Beaumont, P.E., Associate Member[2], (1)Performance Systems Development, Ithaca, NY, (2)Thornton Tomasetti Inc., Portland, ME

2. Determining Your Enclosure U-Factors
Jillian Burgess, The Facade Group, Philadelphia, PA

3. Exploiting Energyplus Capability for Nonenergy Analysis
Ned Lyon, P.E., Member, Simpson Gumpertz Heger Inc., Waltham, MA

Friday, October 2, 10:30 AM-11:30 AM

SEMINAR 16 (ADVANCED)

New Tools and Techniques

Room: Buckhead A

Chair: Drury Crawley, Ph.D., BEMP, Fellow ASHRAE, Bentley Systems, Inc, Washington, DC

This session reviews some of the new innovations being utilized in the industry. One of the presentations uses three recent IPD projects to demonstrate how the integrated project delivery process is leading to real building information modeling-building energy modeling integration. Another presentation discusses the Commercial Building Energy Saver, which analyzes the energy performance of a user's building for pre- and post-retrofit to identify recommended retrofit measures.

1. BIM-BEM Integration in the Context of an IPD
Brian Tysoe, P.Eng., BEMP, Associate Member[1], Laura-Lee Moran[1] and Mark McVan, Ph.D.[1], (1)MCW Consultants Ltd., Toronto, ON, Canada

2. Commercial Building Energy Saver: An Energy Retrofit Toolkit
Yixing Chen, Ph.D.[1], Tianzhen Hong, Ph.D., Member[1], Sang Hoon Lee[1], Mary Ann Piette[1], Rongpeng Zhang, Ph.D., Associate Member[1], Kaiyu Sun[1], Sarah Taylor-Lange[1] and Phillip Price[1], (1)Lawrence Berkeley National Laboratory, Berkeley, CA