

Table of Contents

Occupant-Aware Energy Management: Simulated Energy Savings Achievable Through Application of Temperature Setpoints Learned Through End-User Feedback <i>Kyle Konis; Leluo Zhang</i>	0
A Bayesian Network Model for Predicting the Cooling Load of Educational Facilities <i>Sen Huang; Wangda Zuo; Michael D. Sohn</i>	1
A New Polynomial Based Model for Determining Cooling Tower Evaporation Water Loss <i>Aaron Powers</i>	9
Simulating Empirically-Determined Plug Loads to Improve Knowledge of Design Loads and Assess Building Performance Improvement Opportunities <i>Justin Lueker; Annie Marston; Raghuram Sunnam; Oliver Baumann</i>	17
Modeling and Simulation of a Photonic Radiative Cooling System <i>Weimin Wang; Nick Fernandez; Srinivas Katipamula</i>	25
A Framework for Daylighting Optimization in Whole Buildings with OpenStudio <i>Rob Guglielmetti; Brian Ball</i>	33
Calculation Methodology for the Advanced Lighting Control Systems (ALCS) Energy Savings Calculator Tool <i>Mudit Saxena; David Alexander; Gabe Arnold</i>	41
Sensitivity Study of Annual and Point-In-Time Daylight Performance Metrics: A 24 Space Multi-Year Field Study <i>Amir Nezamdoost; Kevin Van Den Wymelenberg</i>	49
Applicability of DGP and DGI for Evaluating Glare in a Brightly Daylit Space <i>Andrew McNeil; Galen Burrell</i>	57
Simulation Using in Situ Adaptive Tabulation and Fast Fluid Dynamics <i>Dan Li; Wei Tian; Wangda Zuo; Michael Wetter</i>	65
Pollution Transport Through Openings Based on Coupled Indoor and Outdoor Interactions <i>Chao Ding; Khee Lam</i>	72
A Comparison of Gaussian Process Regression and Change-Point Regression for the Baseline Model in Industrial Facilities <i>Joseph Carpenter; Keith Woodbury; Zheng O'Neill</i>	79
Smart Energy Analysis Calculator - An Interactive Tool for Automating Building Energy Analysis & Expediting Energy Audits <i>Claudio Tschätsch Eric Turner Annie Marston Avideh Zakhor Jonathan Lemmond Oliver Baumann</i>	87
Agent Based Modeling for Smarter Building Energy Simulation and Energy Efficiency Technology Evaluation <i>Joshua Bergerson; Ralph Muehleisen; Eric Tatara; Diane Graziano; Nicholson Collier</i>	95
Energy Efficiency Portfolio Analysis Using LCCA and Uncertainty Analysis <i>Philip Keuhn; Michael Gartman</i>	103
Multi-Objective Optimization of Building Envelope, Lighting and HVAC Systems Designs <i>Weili Xu; Khee Lam; Adrian Chong; Omer Karaguzel</i>	110
A Parametric Tool for Community-Scale Modeling <i>Peter Ellis</i>	118
Towards to the Development of Virtual Testbed for Net Zero Energy Communities <i>Dong He; Sen Huang; Wangda Zuo; Raymond Kaiser</i>	125

City Scale Modeling with OpenStudio	
<i>Daniel Macumber; Kenny Gruchalla; Nicholas Brunhart-Lupo; Michael Gleason Julian Abbot-Whitley; Joseph Robertson; Benjamin Polly; Katherine Fleming Marjorie Schott</i>	133
Disparate Standards: Comparing Standard Domestic Hot Water Modeling Methods for Multi-Residential Buildings	141
<i>Xiangjin Yang; Brian Tysoe</i>	
Evaluation of Fan Models for Application to Ecm Fan/Motor Combinations	157
<i>Dennis O'Neal; Peng Yin; Douglas Ingram</i>	
The Impacts of HVAC Downsizing on Thermal Comfort Hours and Energy Consumption	165
<i>Elvin Ruya; Godfried Augenbroe</i>	
Building Efficiency Evaluation and Uncertainty Analysis with DOE's Asset Score Preview	173
<i>Supriya Goel; Nora Wang; Henry Horsey; Nicholas Long</i>	
Incorporating Climate Change Predictions in the Analysis of Weather-Based Uncertainty	181
<i>Parag Rastogi; Marilyne Andersen</i>	
Uncertainty Distributions in Architectural Design Parameters for Detached Houses Located in Bangkok Neighborhoods	197
<i>Daranee Jareemit; Natthaumporn Inprom; Jaruwan Sukseeda</i>	
Developing a Detailed Ruleset for Use in Automating the Performance Rating Method of ASHRAE Standard 90.1-2010	205
<i>Supriya Goel; Michael Rosenberg; Bing Liu; Dimitri Contoyannis; Noah Czech</i>	
Model Like a Programmer: Tools and Techniques for Greater Productivity	214
<i>Michael O'Keefe; Peter Ellis</i>	
The Life Cycle of an OpenStudio Measure: Development, Testing, Distribution, and Application	222
<i>David Goldwasser; Daniel Macumber; Andrew Parker; Edwin Lee; Rob Guglielmetti; Larry Brackney</i>	
Using Python and Eppy for a Large National Simulation Study	230
<i>Jason Glazer</i>	
Co-Simulation for Control Design - A Case Study for Cross-Domain Collaboration	238
<i>Katharina Eder; Edmund Widl; Conrad Gähler; Barbara Beigelböck; Florian Judex</i>	
A BIM Workflow for Iterative and Informative Energy Modeling	244
<i>Ryan Welch; Amy Egarter; Shanta Tucker; Christopher Connock</i>	
Leveraging Building Information Models in IFC to Perform Energy Analysis in OpenStudio	251
<i>Issa Ramaji; John Messner; Robert Leicht</i>	
Using Matlab, Diva and Energy Plus to Simulate Electrochromic Windows	259
<i>Ahoo Malekafzali Ardashan; Jianxin Hu; Wayne Place</i>	
Daylight Glare Analysis for an All Glass Cathedral: Integrating Simulation with Common Sense to Improve Visual Comfort	267
<i>Chanyang Shin; Greg Collins</i>	
Energy Model Validation for Indoor Occupant Heat Stress Analysis	275
<i>Seth Holmes</i>	
The Effect of Balcony Thermal Breaks on Building Thermal and Energy Performance	290
<i>Irina Susorova; Benjamin Skelton</i>	
A Method of Energy Simulation for Dynamic Building Envelopes	298
<i>Jialiang Wang; Liliana Beltran</i>	

Modeling and Simulation of Operational Faults of HVAC Systems Using EnergyPlus	304
<i>Rongpeng Zhang; Tianzhen Hong</i>	
Supervisory Control for Peak Reduction in Commercial Buildings While Maintaining Comfort	312
<i>Jibonananda Sanyal; James Nutaro; David Fugate; Teja Kuruganti; Mohammed Olama</i>	
An Optimization Tool for the Selection of Energy Savings Alternatives in Existing Households: Combining Building Performance, Renewable Energy, and Electric Vehicles	319
<i>Gustavo Carneiro; Godfried Augenbroe</i>	
Comparison of Regression Techniques for Surrogate Models of Building Energy Performance	327
<i>Arfa Ajazi; Leon Glicksman</i>	
Steps Toward Designing a Positive Energy House: Lessons Learnt	335
<i>Rezaei Amir; Bazkiae Bazkiae; Raghuram Sunnam</i>	
Data Visualization for Net Zero Site Energy Design Using Solar Panels for Electricity and Hot-Water Heating Systems with Financial Incentives	343
<i>Marionyt Tyrone Marshall</i>	
Operation Diagnostics - Verifying and Validating Simulated Controls for Energy Models	351
<i>Annie Marston; Raghuram Sunnam; Claudio Tschaetsch; Oliver Baumann</i>	
Regression-Based Building Energy Performance Assessment Using Building Information Model (BIM)	357
<i>Mohammad Asl; Weili Xu; Jin Shang; Barry Tsai; Ian Molloy</i>	
Standardizing Energy Modeling Output	365
<i>Charles Eley</i>	
Performance Based Outcomes - A Bookend Approach Project: Stone 34	372
<i>Michael Frank</i>	
A Study of Energy Use in New York City and LEED-Certified Buildings	377
<i>Cheryl Saldanha; Sean O'Brien</i>	
Automated Methods for Improving Energy Model Quality Assurance and Quality Control	385
<i>Chris Balbach; David Bosworth</i>	
Integrating Whole Building Air Leakage Test Data into EnergyPlus Infiltration Models	393
<i>Edward G. Lyon; Cheryl M. Saldanha</i>	
A High-Granularity Approach to Modeling Energy Consumption and Savings Potential in the U.S. Residential Building Stock	399
<i>Eric Wilson; Craig Christensen; Scott Horowitz; Henry Horsey</i>	
Imputation of Missing Values in Building Sensor Data	407
<i>Adrian Chong; Khee Lam; Weili Xu; Omer Karaguzel; Yunjeong Mo</i>	
Office Zone HVAC Energy Calibration from Easily Available Sensor Data	415
<i>Tomoshi Otsuki; Mitsunobu Yoshida</i>	
Estimating Sub-Hourly Solar Radiation and Effective Sky Temperature from Hourly Weather Data	423
<i>Timothy McDowell; Michaël Kummert</i>	
Impact of ASHRAE Standard 169-2013 on Building Energy Codes and Energy Efficiency	431
<i>Rahul Athalye; Todd Taylor; Bing Liu</i>	
Morphing Climate Data to Simulate Building Energy Consumption	439
<i>Luke Troup; David Fannon</i>	
Optimizing the Use of Reduced Weather Sets in Building Energy Simulations	447
<i>Yu Joe Huang</i>	