



2016 ACEEE Summer Study On Energy Efficiency in Buildings From Components to Systems, From Buildings to Communities

August 21 - 26, 2016

Asilomar Conference Center

Pacific Grove, California

CONFERENCE CALENDAR

OCTOBER 23, 2015

Abstracts due to the ACEEE Summer Study Office

JANUARY 18 - 22, 2016

Authors notified of abstract status — acceptance letters sent and instructions for preparing papers posted

MARCH 11 - 18, 2016

First drafts of refereed papers due to designated Panel Leaders

APRIL 13, 2016

Registration materials available

APRIL 22, 2016

Reviewed drafts sent to authors

MAY 9, 2016

Papers due to Panel Leaders for final review

MAY 20 - 26, 2016

Final refereed papers uploaded

JULY 21, 2016

Conference registration deadline (late fee in effect after this date)

AUGUST 21 - 26, 2016

Summer Study

CONFERENCE ARRANGEMENTS

The Summer Study will be held August 21 - 26, 2016 at the Asilomar Conference Center in Pacific Grove, California. Information about accommodations at Asilomar will be provided in registration materials.

ALL SPEAKERS MUST PAY THE EARLY BIRD REGISTRATION FEE.

The conference will be conducted in a casual atmosphere. The dress is also casual.

The 2016 ACEEE Summer Study is the 19th biennial ACEEE conference on Energy Efficiency in Buildings. A diverse group of professionals from around the world will gather at this preeminent meeting to discuss the technological basis for, and practical implementation of, actions to reduce energy use and the climate impacts associated with buildings. Presentations and discussions will relate to the theme, “From Components to Systems, From Buildings to Communities.”

Opportunities for advancing energy efficiency abound. Advancements in information technology, communications, sensors, controls, social media, and behavior require addressing the whole building, not just its components. The digitization of data and access to tools to convert them into real-time information provide a huge opportunity to overcome the fragmentation of the buildings industry and accelerate sustainability and energy efficiency activities and developments. The investigation of not only building-scale but community-scale programs, integrated government and utility programs, codes and standards, technologies, integrated design processes, operation practices, financing sources, behavioral factors, and workforce development needs will require the integration and utilization of information technology to meet a variety of objectives for buildings industry stakeholders over the duration of a building’s lifetime. The main challenge remains to develop, implement, and maintain systems that foster innovation for both legacy buildings and new construction. Come to the 2016 Summer Study with your ideas, experiences, and vision to move *From Components to Systems, From Buildings to Communities*.

We invite you to contribute your most creative work in the following areas:

- design, operations, construction, and performance of buildings
- program design, implementation, and evaluation
- codes and standards
- utilities
- market transformation
- behavior
- climate change and energy efficiency policy
- zero net energy
- sustainable communities
- smart buildings, smart grid, information technology

2016 ACEEE Summer Study on Energy Efficiency in Buildings From Components to Systems, From Buildings to Communities

Abstracts

Abstracts should relate to the panels described. There are three general categories for abstract submission:

- Oral Presentation
(Presentation + Published Paper)
- Visual Presentation
(Display + Published Paper)
- Display Presentation
(Display + No Published Paper)

Authors may submit more than one abstract in each category, but only one abstract per “lead author” will be accepted and the lead author will be expected to present the resulting paper. Only one presentation by an author will be allowed. If you are “lead author” on more than one abstract selected, you will be asked to designate a co-author as “lead author.” Your abstract may be accepted for a category other than the one you have chosen; therefore, it is important that you rank your abstract submissions in order of priority. To ensure a balanced program, ACEEE reserves the right to exclude papers at any point in the publication process.

Every author is required to register (pay registration fees) to attend the Summer Study. If the registration fee is not received by the deadline date, July 21, 2016, the author’s paper will not be scheduled for presentation or published in the proceedings.

The following criteria will be used for selecting papers for the Summer Study:

- Presentation of new material (must not have been presented at another conference or published in another set of proceedings)
- Relevance of topic to the conference theme
- Likelihood of stimulating discussion and debate
- Clarity of thought and presentation

The Summer Study is intended to be a participatory event and actively seeks knowledgeable reviewers to assist in the peer review of submitted papers. If you wish to volunteer as a reviewer, please fill out the Reviewer Request Form.

Refereed Paper (for Oral or Visual Presentation)

Authors with accepted abstracts will prepare a draft paper that will be peer reviewed and returned to the author for revision. Authors will then submit a final paper to be included in the published proceedings. Authors may be asked to provide the names of up to three potential peer reviewers for their papers. Final papers are limited to 12 pages. Each author of a Refereed Paper for Oral Presentation will be allotted 20 minutes for their presentation at the Summer Study. Authors of a Refereed Paper for Visual Presentation will be assigned to a two-hour display session.

Display Presentation

This category is designed for the presentation of material not suited to a refereed paper. Examples include interactive software, operable technologies, video displays, or complex graphics.

Display sessions, scheduled on two afternoons, are designed so that participants may circulate and discuss these presentations with their authors. Authors will be assigned to a two-hour display session, and will have an area approximately 10’ x 8’ for their displays.

Instructions for Authors

Abstracts must not exceed 250 words of text. The following information must be included at the top of each abstract:

- Title of Abstract
- Category:
 - Oral Presentation
(Presentation + Published Paper)
 - Visual Presentation
(Display + Published Paper)
 - Display Presentation
(Display + No Published Paper)
- Selection of Panel (by Panel number)

Do not include authorship or institutional affiliation on the abstract.

Submit abstracts online:
<http://www.aceee.org/conferences/2016/ssb/call>

2016 Summer Study Organizing Committee

William Livingood (Co-Chair)
National Renewable Energy Laboratory
Nan Zhou (Co-Chair)
Lawrence Berkeley National Laboratory
Rebecca Lunetta, Glee Murray, Steve Nadel, Lynn Pyle, and Justine Seas
American Council for an Energy-Efficient Economy

PANEL DESCRIPTIONS Abstracts from outside the U.S. are encouraged and will be included in all relevant panels below.

1

Residential Buildings: Technologies, Design, Performance Analysis, Construction, and Building Industry Trends

PANEL LEADERS: **Dave Roberts**, *National Renewable Energy Laboratory* and **Meli Stylianou**, *Natural Resources Canada*

SESSION TOPICS: Building science and engineering focusing on high performance solutions for new and existing homes, including: integrated design; envelope load reduction; energy-efficient and demand-responsive equipment, space conditioning for low-load homes; systems and whole-house integration including smart controls and distributed energy resources; net zero energy; indoor air quality, design software and interoperability; performance analysis/modeling; performance monitoring; benchmarking/rating/ labeling; fault detection and diagnostics; commissioning; pre-fab and modular construction trends and techniques.

2

Residential Buildings: Program Design, Implementation, and Evaluation

PANEL LEADERS: **Valerie Richardson**, *DNV GL* and **Tory Weber**, *Southern California Edison Company*

SESSION TOPICS: Fresh ideas or applications in the design, implementation, and measurement of energy efficiency, renewables and load management programs. Program Design: ideas that emphasize cost-effective solutions; move to systems approaches; short- & long-term savings; integrate EE and demand response; mix proven technologies with new ideas for success; residential programs in the age of smart meter data. Evaluation: impacts of online programs/tools; cost-effectiveness of different behavior programs; innovative cost-effectiveness evaluation; using data mining for better predictive value; innovative approaches to evaluating program impacts; understanding customer response to program outreach. Implementation: using innovative delivery channels; delivering cost-effective comprehensive retrofit programs; the role of financing in residential programs; next-generation residential lighting

strategies; new ideas in low- and middle-income programs; maximizing demand response impacts while minimizing customer fatigue; balancing codes with program design; trends in residential building modeling software; incorporating advances in automation and building science; innovations in program design for new and emerging measures; incorporating behavior strategies targeting individuals and community-scale.

3

Commercial Buildings: Technologies, Design, Performance Analysis, Construction, and Building Industry Trends

PANEL LEADERS: **Srinivas Katipamula**, *Pacific Northwest National Laboratory* and **Clay Nesler**, *Johnson Controls*

SESSION TOPICS: Building science and engineering engineering focusing on retrofitting existing buildings and new construction technologies; integrated design; pre-fabrication and modular construction techniques; energy-efficient and demand-responsive equipment, systems and controls for ventilating, space conditioning, lighting, daylighting, and water heating; innovative

technologies; building systems integration; occupant comfort; performance analysis/modeling; smart, integrated control systems; energy information systems; performance monitoring; benchmarking; commissioning; fault detection and diagnostics; on-site use of renewables; distributed energy management; plug loads and data centers, industry and market trends.

4

Commercial Buildings: Program Design, Implementation, and Evaluation

PANEL LEADERS: Tom Coughlin, *National Grid* and Ramin Faramarzi, *Southern California Edison*

SESSION TOPICS: Designing, implementing, and evaluating innovative EE and demand-reduction programs; innovative/advanced program implementation or evaluation approaches; working with non-traditional implementation partners, serving hard-to-reach markets; new integration methods for efficiency, demand response, and influence of business models and leasing arrangements; programs for existing building commissioning and deep retrofits; whole building vs. component approaches; progress towards net-zero energy buildings; integration of utility programs; R&D programs; deploying emerging technologies and strategies; innovative/advanced financing approaches; transitioning government policy into program design

5

Codes and Standards

PANEL LEADERS: Bing Liu, *Pacific Northwest National Laboratory* and My Ton

SESSION TOPICS: Innovations to enhance application of building energy codes and standards; future of commercial and residential codes; new appliances and equipment efficiency standards; innovative technologies; achieving energy savings in the field through code compliance and enforcement; best practices in implementing energy codes; performance-based energy codes and implementation; best practices and field studies of outcome-based codes; high-performance building codes and standards; above-codes utility incentive program design and implementation; appliances and commercial equipment efficiency labeling and enforcement; relationships between demand response and energy codes; designing, implementing innovative standards and supporting policies; promoting emerging technologies big data; international experience

6

Utilities and the Future

PANEL LEADERS: Rafael Friedmann, *Pacific Gas & Electric Company* and Tim Stout, *E Source*

SESSION TOPICS: The future of utility IDSM & EE programs in a low/no demand growth and increasingly renewable and storage supply context; targeted DSM to optimize GHG, E and grid savings; the internet of things and utility programs—best practices in utility EE portfolio design and implementation; innovative policy and evaluation to enhance the success of utility EE efforts; public oversight of utility-led EE portfolios; the role of advanced metering and rate structures; matching program administrative models with state and local utility markets; roles of local government agencies; reliability-focused integrated energy efficiency, demand response and distributed generation programs; energy efficiency as a resource for maintaining grid reliability; successful models of cooperation between ESCOs and utilities

7

Market Transformation with Speed and Scale

PANEL LEADERS: Chad Bulman, *Chicago Bridge and Iron* and Susan Hermetet, *Northwest Energy Efficiency Alliance*

SESSION TOPICS: EE that goes beyond program performance and looks at: the roles of codes, standards, new technologies, market and regulatory changes; leveraging changing attitudes toward energy and climate change; green banks, on bill financing and other financial instruments; compelling early adopters, avoiding free riders and paying for performance; market assessment and market research that inform those initiatives; synergies between government procurement initiatives, programs and market forces; holistic supply chain training and outreach

8

Capturing Savings through Behavior

PANEL LEADERS: Tianzhen Hong, *Lawrence Berkeley National Laboratory* and David Lehrer, *Center for the Built Environment*

SESSION TOPICS: The behavioral components of clean energy solutions and programs targeting energy, water, waste and/or renewable energy at the scale of individual buildings or communities; The use of behavioral strategies to drive EE, demand reduction and installed-measure programs; novel applications of behavioral science; and behavioral strategies that have proven to be cost-effective and scalable. Innovative and creative solutions to pro-environmental behavior, for example: energy visualization, social media, smart building solutions, gamification, compelling product design, mobile applications, publicity campaigns, and the use of data analytics to model and understand impacts of behavior on energy use in buildings.

9

Energy Efficiency and Climate Change Policy: U.S. & Beyond

PANEL LEADERS: Adam Hinge, *Sustainable Energy Partnerships* and John Wilson, *Energy Foundation*

SESSION TOPICS: EE's role in complying with international climate agreements; innovative financing mechanisms for EE; water and EE; How municipalities can integrate and promote EE through sustainability goals and plans; impact of climate adaptation on energy use and efficiency policy; international experience with EE policies; future trends in energy use; integrating EE in carbon registries; policy packages to maximize EE impacts; best practice comparisons of EE policies; EE in air quality planning and local pollution reduction; "What didn't work": benchmarking EE at state, regional, national or international level; carbon accounting methods; environmental justice; measuring and comparing energy productivity

10

Net Zero, Net Positive

PANEL LEADERS: Paul Torcellini, *National Renewable Energy Laboratory* and Peter Turnbull, *Pacific Gas & Electric Company*

SESSION TOPICS: Procuring ZNE buildings; the value of monitoring and feedback for diagnosis, correction and ZNE validation; the role of occupants and operators; case studies of residential and commercial ZNE buildings constructed at low or zero incremental cost including actual construction cost data and energy performance data; can we retrofit buildings to

ZNE performance levels?; what is the use-case for batteries in a ZNE application?; modeling tools and ZNE performance: can ZNE performance be successfully predicted?; community-scale ZNE: time scales and planning processes for optimizing infrastructure investment; wise use of existing infrastructure; building codes, appliance standards and bringing ZNE to scale: state and federal policy integration challenges; the grid and ZNE: challenges and opportunities for "sustainable" rate design for ZNE facilities fair to all ratepayers; practical issues affecting grid operation

11

Resilient, Sustainable Communities

PANEL LEADERS: Katherine Johnson, *District of Columbia Department of the Environment* and Stephanie Ohshita, *Lawrence Berkeley National Laboratory*

SESSION TOPICS: Examining how energy analysis at the community scale can contribute to better decisions about urban infrastructure and communities, including: analysis of energy use, emissions, costs, and other variables when construction or retrofit of infrastructure is master-planned at a community scale rather than building-by-building; quantification of energy benefits from sustainable and resilient building strategies, including: deliberate tree canopy, architectural shade, solar-reflective materials, and blue and green infrastructure; assessment of urban sustainability initiatives, such as value added in terms of real estate and other measures, that strive to create livable and walkable neighborhoods through integrated transportation and land-use planning and zoning; examination of the contribution of energy efficiency and renewable energy measures such as district energy, microgrids, and demand management to urban resilience in response to severe weather events, other emergencies, and ongoing climate instability; and analytical methods and case studies to assess both sustainability and resilience at the community scale, as well as their energy implications, life-cycle and operational

12

Smart Buildings, Smart Grid, Information Technology

PANEL LEADERS: Larry Brackney, *National Renewable Energy Laboratory* and Chad Gilliss, *EnerNOC*

SESSION TOPICS: Novel applications of data science, management, and visualization; how and what technologies can support behavior change; development and application of technologies that inform decision making throughout the building lifecycle; advancements in hardware and software interoperability; application of advanced hardware and software technologies that increase adoption of energy efficiency and demand response in commercial and residential buildings

13

Poster Display Presentations

PANEL LEADERS: Kristen Parrish, *Arizona State University*

SESSION TOPICS: The poster session offers one-on-one discussions with presenters and features various media displays, including posters, software, internet-based tools, and other graphical displays. The panel seeks any presentations related to the conference theme, including those related to large or small scale energy efficiency or renewable energy projects.



American Council for an Energy-Efficient Economy

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Washington, D.C. 20045



From Components to Systems, From Buildings to Communities

Who Should Attend? Individuals interested in energy efficiency and climate change issues associated with buildings including innovative technologies, programs, financing, design and operations practices, policies and education are encouraged to attend, including representatives from industries and utilities; architects; builders; financial and insurance professionals involved with buildings; clean-tech investors; manufacturers of building products, appliances and equipment; building owners and operators; engineers; government personnel; energy and climate researchers and educators; and consultants. Be sure to sign up early for this opportunity to participate in a unique blend of presentations and informal meetings.

Deadline for Abstract Submission: October 23, 2015

ABSTRACT COVER SHEET

Please include one cover sheet for each abstract submitted.
List **LEAD** author first. (Please print legibly.)

TITLE OF ABSTRACT
AUTHOR(S) NAME(S)
COMPANY/ORGANIZATION

LEAD AUTHOR Contact Information:

NAME	
COMPANY/ORGANIZATION	
ADDRESS	
CITY, STATE, ZIP, COUNTRY	
TELEPHONE/WORK	CELL
E-MAIL	

CATEGORY OF SUBMISSION (please check one)

- Oral Presentation (Presentation + Published Paper)
- Visual Presentation (Display + Published Paper)
- Display Presentation (Display + No Published Paper)

Panel Number(s) to which abstract is submitted:

1ST CHOICE:	2ND CHOICE:	3RD CHOICE:
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Panels:

- 1 Residential Buildings: Technologies, Design, Performance Analysis, Construction, and Building Industry Trends
- 2 Residential Buildings: Program Design, Implementation, and Evaluation
- 3 Commercial Buildings: Technologies, Design, Performance Analysis, Construction, and Building Industry Trends
- 4 Commercial Buildings: Program Design, Implementation, and Evaluation
- 5 Codes and Standards
- 6 Utilities and the Future
- 7 Market Transformation with Speed and Scale
- 8 Capturing Savings through Behavior
- 9 Energy Efficiency and Climate Change Policy: U.S. & Beyond
- 10 Net Zero, Net Positive
- 11 Resilient, Sustainable Communities
- 12 Smart Buildings, Smart Grid, Information Technology
- 13 Poster Display Presentations

REVIEWER REQUEST FORM I am best qualified to review for this panel: _____ (indicate only one).

MY AREA OF EXPERTISE IS:	
NAME	
COMPANY/ORGANIZATION	
ADDRESS	
CITY, STATE, ZIP, COUNTRY	
WORK PHONE	CELL
E-MAIL	

Submit each abstract by October 23, 2015

via ACEEE's Web site: <http://www.aceee.org/conferences/2016/ssb/call>