



October 26–27, 2006
The Long Beach Hyatt, Long Beach, California

Sponsored by:

Emerging Technologies Coordinating Council

Southern California Edison, Southern California Gas Company, San Diego Gas and Electric Company,
Pacific Gas and Electric Company, California Energy Commission

New York State Energy Research and Development Authority

Organized by:

American Council for an Energy-Efficient Economy (ACEEE)

Thursday, October 26

PLENARY SESSION

8:30 to 10:00 am

Conference Welcome and Opening Remarks

Regency Ballroom ABCH

Pedro Pizarro, Senior Vice President, Southern California Edison

California's Approach to Emerging Technologies: An Update

Presenter: Art Rosenfeld, Commissioner, California Energy Commission

Panel: Tactics for Operationalizing Emerging Technologies

Moderator: Gene Rodrigues, Director of Energy Efficiency, Southern California Edison

*Panelists: Lynda Ziegler, Senior Vice President, Southern California Edison
Beverly Alexander, Vice President, Pacific Gas and Electric Company
Anne Smith, Senior Vice President, Sempra Energy Utilities
Martha Krebs, Deputy Director, California Energy Commission*

Discussion

Facilitator: Gregg D. Ander, Manager, Southern California Edison

Description: The opening plenary will provide an introduction to California's activities for Emerging Technologies, including a look at some of the key policy and implementation issues that face research, development and commercialization efforts in the state. An overview presentation by Art Rosenfeld of the California Energy Commission will be followed by a panel

of leading members of California's investor-owned utilities and the Commission who will discuss tactics for fostering the development of energy-saving innovations and for bringing new technologies to market.

WORKING SESSION I
10:30 to 12:00

Technologies and Practices Track 1
Towards Regionally Optimized Residential HVAC

Regency Ballroom D

Facilitator: Scott Pigg, Energy Center of Wisconsin

Presenters: Adam Hadley, Bonneville Power Administration, and Duane Hallowell, Hallowell International
Ramin Faramarzi and Stephan Galanter, Southern California Edison

Description: This session will provide up-to-date insights into developments in residential-sized HVAC equipment optimized for a particular climate type. The first presentation will discuss cold-climate heat pumps, specifically whether they can have a cost-effective application in moderate climates for reducing strip heat demand. The session will also cover hot-and-dry climate central AC. Finally, participants will explore the regulatory and market barriers that are inhibiting regional HVAC optimization and discuss what can be done to overcome them.

Technologies and Practices Track 2
From Potential to Practical in New Commercial Buildings: What Can Get Us 50% Savings and What Stands in Our Way?

Regency Ballroom E

Facilitator: Cathy Higgins, New Buildings Institute

Presenters: Mark Frankel, New Buildings Institute
Woodrow Clark, II, Clark Communications, LLC

Description: This session combines examples and experience addressing how to achieve 50% or more energy savings in commercial buildings. The speakers have extensive experience on dozens of project design teams and will share best practice examples of the newest highly energy-efficient buildings. The focus is on technologies and design integration practices that are "big hitters" for achieving significant savings but which are under-adopted or "emerging" in today's market. We will discuss what commonalities are found in the nation's most efficient new buildings, what role technological advances versus design integration play in building performance, how ET and DSM programs can influence integration of technologies, and finally, how to know when a building is successful.

Technologies and Practices Track 3
Demand Response: Customer-Side Technologies

Regency Ballroom F

Facilitator: Carlos Haiad, Southern California Edison

*Presenters: Dave Rivers, McGEE Co.
Michael Kintner-Meyer, Pacific Northwest National Laboratory
Carlos Haiad, Southern California Edison*

Description: This session will present demand response and demand shifting strategies applicable to a range of residential and commercial facilities. Presentations will cover innovative strategies including dispatchable lighting systems and programmable communicating thermostats, as well as the potential utility benefits they entail. Participants will consider how effective demand response strategies are in reducing electric load and what barriers obstruct the implementation and acceptance of these strategies. Finally, discussion will focus on the benefits of demand response to the end-users, the utilities and the state.

Policy and Process Track
Selecting Emerging Technologies for Evaluation and Program Development

Shoreline A

Facilitator: Peter Douglas, New York State Energy Research and Development Authority

*Presenters: Wayne Krill, Pacific Gas and Electric Company
Harvey Sachs, American Council for an Energy-Efficient Economy*

Description: Long-term success of market transformation and resource acquisition requires continuing efforts to identify, select, and support emerging technologies and practices (ETs). Early support can shorten the time until these emerging technologies have enough market share to be considered for public benefit programs. ACEEE began systematic evaluation of ETs in the early 1990s. Other groups that carry out evaluations include FEMP, California ETCC, NYSERDA, CEE, and some regional programs, such as NEEA. The goal of this session is to examine two alternative selection and screening approaches. The session will then expand to include discussion of all selection and screening approaches and focus on ways to improve selection of candidates for ET programs.

Strategies and Tactics Track
Success Stories and Learning Experiences (The Good, the Bad, and the Ugly)

Shoreline B

*Facilitators: Jonathan Livingston, Pacific Gas and Electric Company
Jim Parks, Sacramento Municipal Utility District*

*Presenters: Jeffrey Harris, Northwest Energy Efficiency Alliance
A.Y. Ahmed, Sempra Energy*

Description: Many utilities and related organizations perform assessment projects to validate emerging technologies' performance. These projects always provide learning experiences—some positive and some challenging. Whether the results are positive or not, these experiences provide opportunities: for us to expand our understanding of technology performance and customer acceptance; to improve technologies for the next round of assessment and accelerate commercialization; and to avoid mistakes in future solution development. This session will explore the successes and failures that program managers have experienced with emerging technology assessment projects. During discussion, audience members and panelists will be invited to share their real-world experience with emerging technology assessment projects, commercialization, and evaluation.

SPECIAL KEYNOTE
Regency Ballroom ABCH
12:00 to 12:30

Dian Grueneich, Commissioner, California Public Utility Commission

LUNCH
Regency Ballroom ABCH
12:30 to 2:00

Luncheon Address: How Could Climate Changes Affect Summer Weather in Western North America?

Speaker: *Dan Cayan, Scripps Institution of Oceanography, UC San Diego*

Description: Warming to significantly greater levels above present-day climatological temperatures is quite certain due to accumulations, present and future, of greenhouse gases (GHG) in the atmosphere from fossil fuel burning. Climate models, accounting for the projected GHG increases, suggest an increasingly frequent, more intense, and more persistent occurrence of summer hot spells as global warming progresses over the next century. Interestingly, from historical observations over the western United States, there is little evidence for such an increase in daytime temperature extremes, but an increase does show up in nighttime temperatures. Historical observations and climate models both indicate that summer heat spells will be more intense during periods of prolonged dryness, suggesting that continental droughts may be periods when we are most vulnerable to severe heat waves.

WORKING SESSION II
2:00 to 3:30 pm

Technologies and Practices Track 1

Regency Ballroom D

Two Advanced Residential Water Heating Technologies

Facilitator: Ed Becker, Southern California Gas Company

Presenters: Marshall Hunt, Super Efficient Gas Water Heater Appliance Initiative (SEGWHAI)
David Kalensky, Gas Technology Institute

Description: In the U.S., almost all houses use storage water heaters. For conventional storage-type designs with open flues, efficiency improvements have essentially stagnated, with Energy Factor (EF) hovering around 60% (depending on size). In response, there is interest among utilities and others in fostering the development and increasing the market share of advanced (condensing or near-condensing) storage water heaters with 0.74–0.90 EF. Much of the world has chosen a different approach, by adopting instantaneous or “tankless” water heaters that typically have 0.80 EF. This session will provide an overview of the status of competing technologies, including a short update on heat pump water heaters and solar water heating. Discussion will compare the efficiency, advantages, drawbacks, and areas of concern of the major tankless and storage-type high-efficiency contenders.

Technologies and Practices Track 2

Regency Ballroom E

What’s New in Daylighting?

Facilitator: Kosta Papmichael, California Lighting Technology Center, UC Davis

Presenters: Douglas Paton, Daylighting Controls Specialist
Bill Burke, Pacific Energy Center

Description: This session is focused on new and emerging technologies for daylighting applications. Bill Burke will cover fenestration technologies, including windows and skylights, glazing, and shading systems. Doug Paton will cover controls technologies, including photo sensors, electric lighting ballasts, controllers, and software for daylight harvesting. A follow-up discussion will address issues related to daylight harvesting, focusing on reliability and effectiveness of communications and controls, and the impact of increasing electric lighting efficacy on the value of daylight harvesting.

Technologies and Practices Track 3

Regency Ballroom F

Demand Response: Utility-Side Technologies (Meter to Grid)

Facilitator: Jim Parks, Sacramento Municipal Utility District

*Presenters: Erich Gunther, EnerNex Corporation
Paul De Martini, Southern California Edison*

Description: There are many missed opportunities for demand response upstream of the customer meter, and these opportunities are rarely used by utilities. This session will provide examples of demand response initiatives that utilities can use to reduce peak load and improve grid reliability. Presenters will provide information on the latest advanced metering infrastructure (AMI) technologies, including one-way and two-way communication devices, and discuss how AMI meshes with the way utilities would like to do business.

Policy and Process Track

Shoreline A

Seed and Early Stage Financing: Investing to Advance Innovation

Facilitator: Andy Hargadon, UC Davis Energy Efficiency Center

*Presenters: Carol Sands, Angel's Forum, LLC
Zach Gentry, Adura*

Description: The purpose of this session is to describe recent trends in early stage financing and to offer a dialogue around alternative mechanisms for obtaining early stage support for emerging technologies. Presentations will inform participants about Angel financing, early stage technology transfer, obtaining government research, development and demonstration support, and how to determine which companies are good candidates for incubation. Participants will have the opportunity to discuss these topics within the context of their own states and technology programs.

Strategies and Tactics Track

Shoreline B

Creating New Potential: How the Evaluation of Utility Programs Can Help or Hinder the Search for New Technologies

Facilitator: Carol Yin, Yinsight

*Presenters: Steve Grover, ECONorthwest
Rafael Friedmann, Pacific Gas and Electric Company*

Description: The potential for energy savings in California is decreasing due to market saturation of currently available technologies. This session will engage the audience in a discussion of the current goals of California utility ET programs and how the evaluation of those goals may be tuned to help or hinder the overall goal of assessing candidate technologies. Two

expert speakers will familiarize the audience with the context in which California utility evaluations are taking place and current evaluation activities. The discussion will address the following questions: If program managers "study to the test," or manage ET programs with the goal of receiving a positive evaluation, what are the consequences for program implementation and effectiveness? What are some of the challenges of evaluating utility ET programs, and how can they be overcome? Which metrics are appropriate for evaluating utility ET programs?

WORKING SESSION III **4:00 to 5:30 pm**

Technologies and Practices Track 1

Regency Ballroom D

Designing New Homes to Provide 50% Energy Savings

Facilitator: Danny Parker, Florida Solar Energy Center

*Presenters: David Springer, Davis Energy Group
Ren Anderson, National Renewable Energy Laboratory*

Description: The purpose of this session is to illustrate how to design new homes in the U.S. to produce a 50% whole house energy savings in a variety of climates, a key requirement to achieving zero energy homes. Presentations will describe recent experiences around the U.S. with innovative systems. The session will explore insulation, high performance windows, reflective roofing, duct and HVAC systems, and lighting and appliances. Multiple foundation schemes will also be considered, as well as adding photovoltaic systems, including solar water-heating systems, to realize zero energy homes. Participants will also discuss alternatives for HVAC and water heating systems, and the potential for feedback devices to help control miscellaneous loads. The presentations will provide examples of how to analyze the various options using software tools as well as experiences with highly innovative buildings.

Technologies and Practices Track 2

Regency Ballroom E

LED Lighting Today and Tomorrow

Facilitator: Don Aumann, California Lighting Technology Center

*Presenters: Waqidi Falicoff, LPI
Bob Steele, Strategies Unlimited*

Description: This session will take a close look at why there is so much interest and activity in LEDs. Presentations will focus on where LED technology stands currently (cost, efficacy, color) and where it is projected to go in the future. Speakers identify key niches (and products) in which LEDs have already seen market success and highlight promising new markets for LEDs over the next five years. Participants will also discuss what potential barriers obstruct LED market growth, what LED markets are most interesting for ET programs, what types of ET programs

could accelerate LED market penetration, and finally, what if any performance targets (LPW, life) must LEDs achieve before ET programs take action.

Technologies and Practices Track 3

Regency Ballroom F

Monitoring and Controls for Commissioning and Demand Response

Facilitator: Mary Ann Piette, Lawrence Berkeley National Laboratory

Presenters: Sila Kiliccote, Lawrence Berkeley National Laboratory

Mike Anderson, Newcomb Anderson McCormick

Todd Rossi, Field Diagnostic Services, Inc.

Description: The purpose of this session is to talk about performance monitoring, advanced controls, diagnostic systems, demand response automation, and other advanced technologies and strategies to reduce energy and peak demand in commercial buildings. The first presentation will focus on automating demand response and diagnostic tools, including demand response automated servers and pre-configured strategies. The second presentation will look closely at monitoring base commissioning, emphasizing monitoring tools that are better oriented toward facility operators. Energy and peak demand savings will be discussed. The third presentation will review emerging portable diagnostic tools and monitoring systems for HVAC. The session will include a broad discussion on impacts on annual energy use and peak demand that are possible using the latest control, diagnostics, and monitoring technologies.

Policy and Process Track

Shoreline A

Energy Efficiency: Challenges and Opportunities for the Private Sector Investor

Facilitator: Dan Adler, California Clean Energy Fund

Presenters: Robert Hinkle, Nexant

Craig McDonald, Navigant Consulting

Description: The purpose of this session is to discuss trends in clean energy investing. It will give a close look at who is investing in energy efficiency and whether energy efficiency is getting its fair share in the private investor's portfolio. Participants will be invited to explore different paths to successful commercialization of emerging technologies with a look at the venture capitalists' appraisal of energy efficiency deals and opportunities for corporate strategic partnerships, including opportunities to export energy efficiency solutions overseas. Some attention will also be devoted to the passage of AB 32 and whether it may accelerate private sector attention to energy efficiency solutions.

ENERGY STAR® and Golden Carrot: Rethinking Roles for Emerging Technology

Introduction

Facilitator: Harvey Sachs, American Council for an Energy-Efficient Economy

Presenters: [Marc Ledbetter, Pacific Northwest National Laboratory](#)
[Martha Brook, California Energy Commission](#)

Description: ENERGY STAR has traditionally been used to guide buyers to higher performing products within established technology categories. In contrast, Golden Carrot (or technology procurement) programs have been used to help introduce new technologies and products to the market. The purpose of this session is to explore these program models with a focus on how they might better work together, and how ENERGY STAR might play a more active role in supporting emerging technology introduction. We will discuss the ideal conditions for a Golden Carrot program to feed an emerging technology into ENERGY STAR, and whether ENERGY STAR can support emerging technology introduction on its own, without the assistance of a Golden Carrot or similar program. We will also look at past emerging technology introduction failures to see how ENERGY STAR might help avoid these failures in the future.

Emerging Technologies Showcase and Cocktail Reception

Beacon Ballroom

5:30 to 8:00 pm

This exciting event will feature hands-on displays of up-and-coming technologies, including advances in lighting, controls, air conditioning, ventilation, motors, and pumps in an atmosphere that promises to facilitate lively interactions. Researchers from leading technology development centers as well as representatives from manufacturers will be on hand to describe their innovations.

Friday, October 27

**PLENARY SESSION II
8:30 to 10:00 am**

Emerging Technology Activities Beyond Ecotopia

Regency Ballroom ABCH

Moderator: Steven Nadel, Executive Director, American Council for an Energy-Efficient Economy

*Presenters: Paul DeCotis, Director of Energy Analysis, New York State Energy Research and Development Authority
David Terry, Executive Director, Association of State Energy Research and Technology Transfer Institutions
Jacques Beaudry-Losique, Program Director, U.S. Department of Energy
Julia McNally, Manager of Planning, Coordinating and Reporting, Ontario Power Authority*

Description: This session will survey emerging technology activities nationally and in several regions of North America. Speakers will represent the New York State Energy Research & Development Authority (a leader in energy efficiency R&D for more than 25 years), the Association of State Energy Research and Technology Transfer Institutions (a coalition of state organizations), the U.S. Department of Energy (with major programs on R&D in the buildings, industrial, and transportation sectors) and the Ontario Power Authority (identifies and promotes promising technologies). Following initial presentations, discussion will compare and contrast the different approaches being used around the continent and identify some particularly promising initiatives.

**WORKING SESSION IV
10:30 to noon**

Technologies and Practices Track 1

Emerging Industrial Energy Efficiency Technologies

Regency Ballroom D

Facilitator: Pramod Kulkarni, California Energy Commission

*Presenters: Donald Erickson, Energy Concepts Co.
John Sullivan, Alzeta Corporation*

Description: ThermoSorber* is a new technology that uses a novel thermodynamic design that enables extracting waste heat thus increasing system efficiency and improving economics. The technology has been successfully demonstrated in industrial settings to co-produce hot and chilled water with half the energy required for normal hot water production. A currently

operating application at a food processing facility and other potential applications in other industries will be discussed. The session will also discuss the use of an innovative burner control technology for meeting stringent NOx emissions standards without the corresponding increase in high horsepower motors commonly used for flue gas recirculation. Recent applications of the control technology in an industrial facility in California will be presented.

* Registered trademark of Energy Concepts Co.

Technologies and Practices Track 2

Regency Ballroom E

Wireless Building Controls: Energy-Saving Opportunities

Facilitator: Michael Kintner-Meyer, Pacific Northwest National Laboratory

*Presenters: Jim Benya, Benya Lighting Controls
Clifford Federspiel, Federspiel Controls*

Description: This session will present the energy and demand saving opportunities for wireless sensors and controls in buildings. Emerging technologies for wireless lighting and HVAC control applications will be introduced. The session will also discuss impediments to the broader market penetration of wireless sensors and controls in buildings and identify potential paths to overcome them.

Technologies and Practices Track 3

Regency Ballroom F

Serving Up Efficiency to Data Centers

Facilitator: Jay Stein, E Source

*Presenters: Bill Tschudi, Lawrence Berkeley National Laboratory
Lorie Wigle, Intel Corporation*

Description: This session will cover technological advances—DC power distribution, better HVAC systems, more efficient back-up power systems, more efficient servers—that have the potential to improve the efficiency of data centers. We will discuss the barriers that are obstructing the diffusion of these technologies into the data center sector, and the public and corporate policies that would help overcome them.

Policy and Process Track

Beacon Ballroom A

State-Based Commercialization Assistance Funds—More than Money

Facilitator: David Terry, Association of State Energy Research and Technology Transfer Institutions

*Presenters: Preston Schutt, CleanTech Partners
Dan Adler, California Clean Energy Fund*

Description: The purpose of this session is to explore how partnerships can accelerate the commercialization and adoption of energy-efficient technologies and strategies in the marketplace. Creative collaboration with research centers, universities and private companies can speed the adoption of energy efficiency innovations. Participants will discuss a multidisciplinary approach to commercialization, including using the UC/CSU system to demonstrate emerging technologies and practices, and partnering to commercialize wireless lighting controls. The session will also provide an update about the latest from the UC Davis Energy Efficiency Center.

