



National Symposium on Market Transformation

Large-Scale Transformation

Marriott Wardman Park • Washington, DC • April 20-22, 2015

CONFERENCE PROGRAM

Monday, April 20

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| 12:00 pm to 7:00 pm | REGISTRATION | Registration A |
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| 1:00 pm to 5:00 pm | MT 101 | Wilson A/B/C |
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Moderator: **Joanne Morin**, Consortium for Energy Efficiency

Speakers: **Jane Peters**, Research Into Action
David Cohan, United States Department of Energy

"MT101" is an introductory course for those new to the field who want to learn the fundamentals of market transformation. The session will cover a range of topics including an overview of market transformation as one strategy for driving energy-efficient products and services, administrative models for the delivery of market transformation programs, various program models used to serve different market segments, and program evaluation.

Tuesday, April 21

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| 7:00 am to 8:00 pm | REGISTRATION | Registration A |
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| 7:30 am to 8:15 am | BREAKFAST | T.M. Ballroom North/East |
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| 7:30 am to 8:15 am | ACEEE ALLY BREAKFAST | Hoover |
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(This breakfast is for current ACEEE Ally members by invitation only.)

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| 8:15 am to 10:00 am | WELCOME, KEYNOTE & PLENARY SESSION | T.M. Ballroom South/West |
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Welcome and Introductions: **Suzanne Watson**, American Council for an Energy-Efficient Economy

Keynote Address: **Senator Angus King, Jr.** (I-Maine)

Large-Scale Transformation

Moderators: **Steve Nadel**, American Council for an Energy-Efficient Economy
Ed Wisniewski, Consortium for Energy Efficiency

Speakers: **Sue Kochan**, Chief Executive Officer & Partner, Brand Cool
Val Jensen, Senior Vice President, Customer Operations, ComEd

10:00 am to 10:30 am**BREAK***South/West Foyer***10:30 am to 12:00 pm****CONCURRENT SESSIONS***Session 1A**T.M. Ballroom South***Accelerating the Transition from Emerging to Mainstream**Moderator: **Kim Erickson**, Consortium for Energy EfficiencySpeakers: **Jennifer Williamson**, Bonneville Power Administration
Andrew Mitchell, United States Department of Energy
Peter Banwell, United States Environmental Protection Agency

In order to achieve ongoing energy efficiency improvements, rate-payer funded programs rely on the introduction of new, higher efficiency technologies. Yet the vast majority of emerging technologies fail to take hold in the market, even if they are competently designed, manufactured, and marketed. Emerging technologies programs can play a key role in identifying and supporting promising candidates making the transition from emerging to mainstream. This session will begin with an overview of how these programs are working to strategically accelerate the transition of new technologies into the mainstream. Speakers will then highlight how their individual programs are leveraging regional and binational efforts to support this transition for three respective areas: HVAC, commercial foodservice, and controls technologies.

*Session 1B**T.M. Ballroom West***Community Energy Planning and Implementation: New Opportunities for Increasing Program Uptake**Moderator: **Rebecca Foster**, Vermont Energy Investment CorporationSpeakers: **Tami Gunderzik**, Xcel Energy
Rich Freeh, City of Philadelphia

New opportunities exist for utilities to enhance customer relationships, increase energy savings, and further transform markets by working closely with local governments and community stakeholders – such as schools, churches, business associations, and more – to enable and support their efforts related to energy management. The purpose of this session is to reflect on the changing relationship between utilities and customers as we move towards the Utility of the Future and contemplate the role of community in scaling up energy efficiency and increasing market transformation. Participants will also learn from a diversity of leaders who are implementing community energy initiatives that increase uptake in regulated efficiency programs, result in greater energy savings and other community co-benefits, and accelerate market transformation.

12:00 pm to 1:30 pm**LUNCH***T.M. Ballroom North/East*Keynote Speaker: **Mike Bull**, Director of Policy and Communications, Minnesota Center for Energy and the Environment**1:30 pm to 3:00 pm****WORKING SESSIONS***Behavior Track**T.M. Ballroom West***A1: Shifting Workplace Behaviors to Maximize Savings**Moderator: **Kathy Kuntz**, Cool ChoicesSpeakers: **Danielle Anderson**, Duke Energy
Richard Miller, Triple Point Energy
Scott Thach, Alliance to Save Energy

Innovative behavior change programs can deliver substantive energy savings across commercial and industrial facilities. This session will feature three diverse programs targeting behaviors in K-12 schools, commercial buildings and industrial facilities. Presenters will provide information on the strategies used to change behaviors and results to date. Presenters will also discuss how these programs can facilitate spill over into the residential sector. We will reserve sufficient time to interact with attendees to talk about the best strategies for implementing, measuring, and replicating behavior change programs.

Discussion Questions:

- What behavior change strategies seem particularly effective in commercial and industrial settings?
- In the residential sector we see different ranges of savings associated with different kinds of program models (e.g. home energy reports typically yield 1-2% savings while some feedback devices and community-based approaches yield higher savings). What are the savings trends associated with these commercial and industrial models? How can we maximize savings?
- Leveraging schools—and school children—is appealing. What are the challenges and benefits associated with this approach?
- When we transform an individual's energy habits, it's reasonable to think that savings will occur both at work and at home. How might we effectively track those cross-sector impacts?
- What do we know about the persistence of behavioral savings in the commercial and industrial sectors?

*Commercial & Multifamily Track**T.M. Ballroom South***B1: Sustainable Office Design: Transforming Tenant Efficiency**Moderator: **Patrick Finch**, Waypoint Building GroupSpeakers: **Rishi Sondhi**, Eversource Energy
Edward Bartholomew, National Grid

The split-incentive issue is a significant barrier to incorporating energy efficiency into Tenant Improvement (TI) projects. Communicating with obtaining buy-in from the proper stakeholders in this hard-to-penetrate market is a challenge faced by utilities across the country. National Grid and Eversource Energy are introducing a new initiative called Sustainable Office Design (SOD) as a means of delivering integrated technical solutions to the leased commercial office market. The goal is to increase penetration of utility-delivered savings in the leased office TI sector through a quick-turnaround, \$1/ft² lighting incentive based on achievement of pre-approved energy performance targets. Eversource Energy and National Grid are evaluating the uptake of the lighting/controls components now, but would eventually like to expand to plug-loads, HVAC controls, and energy management. This SOD program is the first of its kind to directly engage tenants, and in the process, address the all-too-common issues of split-incentives between commercial building owners and tenants. This session will introduce the traditional challenges that split-incentives projects present, how they were addressed with the Sustainable Office Design (SOD) program, and what lessons learned throughout design and implementation of these concepts.

Discussion Questions:

- What has been the biggest struggle in convincing design teams to buy into the incentive?
- How does this program model differ from traditional utility incentive models?
- How does your utility achieve such a short application turn-around time? What organizational structure enables the streamlined approach?
- How are utility efforts interacting with the evolution of commercial building lighting codes and code enforcement? DLC certifications, IES or IALD inputs, etc.
- How do you market the program to tenants and building owners?
- How would you build out this program to support other energy-efficiency measures in a tenant-leased space, such as HVAC? Are there unique attributes to lighting that make this feasible?

*Program Strategies Track**Harding***C1: When Deep Energy Savings are At Risk: How to Support the Successful Market Introduction and Long-term Success of Super-Efficient Products**Moderator: **Dave Lis**, Northeast Energy Efficiency PartnershipsSpeakers: **Alice Rosenberg**, Consortium for Energy Efficiency
Christine Riegler, Northwest Energy Efficiency Alliance
Don Wilson, LG Electronics USA
Antonio Bourza, United States Department of Energy

Super-efficient technologies (e.g. heat pump clothes dryers, heat pump water heaters, variable speed Air-Source heat pumps) present exciting energy savings opportunities. Heat pump clothes dryers recently arrived in select markets throughout the United States and present the latest opportunity for deep energy savings in residential plug loads/appliances/electronics. As an

energy-efficiency community, how do we support dryers and other emerging technologies in the market, with an eye to long-term transformation? This session will begin with a brief look at some historical examples of super-efficient market introductions, the good (front-load clothes washers) and the bad (CFLs, first-gen heat pump water heaters). Panelists will then share a variety of perspectives and experiences with respect to supporting market introductions of super-efficient products. What types of infrastructure needed to be in place and what barriers needed to be addressed as they worked to bring new technologies into the market and adopted at scale? How important is it to deploy a coordinated approach between efficiency stakeholders and industry actors in order to make this transformation successful? We'll also take a look into the future at the next generation of emerging super-efficient technologies.

Discussion Questions:

- How does your organization define “super-efficient”? What makes a product “super-efficient”?
- As an energy efficiency community, what activities should we pursue to ensure that super-efficient products are successfully introduced into the market?
- How can utility incentives be used to support deep energy efficiency goals?
- What lessons can we draw from past super-efficient appliance market introductions?
- What can your organization contribute to these near- and long-term market transformation efforts?

Lighting Track

Hoover

D1: Optimizing Lighting Control Performance: The New Frontier

Moderator: **Jeff McCullough**, Pacific Northwest National Laboratory

Speakers: **Gabe Arnold**, Northeast Energy Efficiency Partnerships
Nate Mitten, Kimco Realty Corporation
Kelly Sanders, Northwest Energy Efficiency Alliance
Jeff McCullough, Pacific Northwest National Laboratory

New advanced lighting control technology offers tremendous benefits to energy efficiency programs and their customers, yet significant market barriers must be addressed to realize the full potential of the opportunity. Work is needed in the areas of interoperability, standards, understanding savings and benefits, educating designers, installers, and users, and developing new and effective energy efficiency program offerings to better support this technology. This session will discuss innovative approaches that efficiency programs are planning to address these challenges. It will also discuss lessons learned from a large facility management company that won a 2014 Lighting Energy Efficiency in Parking (LEEP) Campaign award for Largest Absolute Number of Facility Upgrades for implementing a custom web-based lighting control system that achieved 10-20% savings at 160 sites across the US.

Discussion Questions:

- With so much innovation happening in the lighting controls space currently, how can efficiency programs best encourage innovation while also remaining current on new systems and approaches?
- How might the energy-efficiency community encourage the controls industry to develop lighting control systems with improved compatibility and inter-operability capabilities?
- What are the primary challenges faced by efficiency programs as they develop and implement lighting controls incentive programs?
- Are there examples of upstream and midstream incentive program approaches for supporting lighting controls that appear to be working well? What can we learn from them?
- Is there a way to streamline administration of customized incentive programs?
- What guidance is available to help customers select the optimal lighting controls system for their project?

Financing Track

Coolidge

E1: Valuing Energy Efficiency and Solar in the Real Estate Industry

Moderator: **Joan Glickman**, United States Department of Energy

Speakers: **Cliff Majersik**, Institute for Market Transformation
Ben Hoen, Lawrence Berkeley National Laboratory
Rebecca Foster, Vermont Energy Investment Corporation

Recent studies show that prospective home buyers are looking for homes with green and energy-efficient features and are willing to pay more for them. However, the real estate system does not make it easy for consumers to get information about these homes. Few multiple listing services (MLSs) include “green fields” that document the green and energy-efficient features of homes listed for sale. In addition, most real estate agents are not trained in supporting buyers and sellers of energy-efficient homes, and appraisers and mortgage lenders often lack the training to appropriately value energy efficiency and solar. This session will report on recent activity in Washington, DC to green the MLS and track sales data for high performance homes, and present the results of a recent study to quantify the value that solar photovoltaic (PV) systems add to home sales. It will also share how Vermont is engaging with the real estate industry and MLS to promote energy-efficient homes.

Discussion Questions:

- What are the pros and cons of different property valuation techniques for energy efficiency and solar?
- What steps can energy-efficiency programs take to ensure that information about high performance homes can be factored into real estate transactions?
- How can energy-efficiency programs support homeowners in finding trained realtors and appraisers?

3:00 pm to 3:30 pm

BREAK

South/West Foyer

3:30 pm to 5:00 pm

WORKING SESSIONS

Behavior Track

T.M. Ballroom West

A2: How Data Is Being Used to Change the Way We Design, Implement, and Evaluate DSM Programs

Moderator: **Michael Li**, United States Department of Energy

Speaker: **Andrew Stryker**, DNV GL

Alex Orfei, Opower

Rick Counihan, Nest Labs

This session will describe some of the ways companies are extracting meaning from data to deliver innovative ways of designing, implementing, and evaluating DSM programs. For example, AMI data allows us to understand when savings are occurring in residential programs which allows us to determine the demand reduction value of these programs. AMI also allows us to segment customers by load profile – something that can help deliver demand response programs. AMI data is just the tip of the iceberg. There are numerous other rich streams of data that are transforming the DSM.

Discussion Questions:

- What can we do with the growing quantity of smart meter data? With all of the available information and integral data, and what is useful and what is not?
- What are the related challenges?
- What do these data tell us about the occupant actions that drive behavior-based energy savings?
- What are the analytic techniques for evaluating behavior using smart meter data?
- What are the guidelines and protocols that summarize best practices for analytics and evaluation?

Commercial & Multifamily Track

Harding

B2: Multifamily Energy Efficiency Retrofit Programs: Strategies for Engaging Building Owners

Moderator: **Thom Amdur**, National Housing & Rehabilitation Association

Speakers: **Ed Connelly**, New Ecology

Toby Ast, Preservation of Affordable Housing

Building owners are key stakeholders in implementing multifamily energy efficiency retrofits. This session looks at two different engagement strategies that work to gain buy-in from these individuals and organizations. The first approach involves creating a baseline of energy and water use to directly engage with building owners to complete efficiency retrofits. The second approach demonstrates a successful program example offering a comprehensive program design for building owners, including audits, analyses, design, administration, commissioning, and financing to increase customer participation and satisfaction.

Discussion Questions:

- What are the typical barriers to increasing program participation for multifamily retrofits?
- How important is benchmarking and what kind of insights from metered utility data are useful in making a convincing case for retrofits?
- How does a comprehensive program design address key stakeholder concerns?
- What are the important considerations for program administrators desiring to design a comprehensive offering?
- How can program incentives be used to support deep energy efficiency retrofits?

*Program Strategies Track**T.M. Ballroom South***C2: Innovative Upstream Models to Accelerate Program Goals and Amplify Results**Moderator: **Alexis Allan**, Northwest Energy Efficiency AllianceSpeakers: **Tim Michel**, Pacific Gas and Electric Company
Paul Campbell, Sears Holding
Peter Banwell, US Environmental Protection Agency

As the energy efficiency landscape changes, so do program models and approaches. In particular new models and approaches are responding to changing retailer interest, data limitations, cost-effectiveness hurdles, and success of previous product programs. This session will use real-world examples on how innovative residential program structures are capitalizing on the retail channel to leverage their infrastructure and partnership to increase program participation, reach a greater suite of customers, and maximize savings potential of plug load products.

Discussion Questions:

- As an energy efficiency community, what specific practices support growing and maintaining successful long-term partnerships with our market partners?
- What barriers and opportunities have been identified with these new approaches?
- What are the risks associated with midstream programs and how can the energy efficiency community best mitigate these risks?
- What lessons have you learned that you wish you'd known during design?

*Lighting Track**Hoover***D2: Shedding Light on Market Transformation: What Happens When CFL Programs Go LED?**Moderator: **Claire Miziolek**, Northeast Energy Efficiency PartnershipsSpeakers: **Elizabeth Murphy**, The United Illuminating Company
Mananya Chansanchai, Pacific Gas and Electric Company
Rob Carmichael, Cadeo Group

As minimum performance standards rise and the cost and quality of new lighting technologies improve, efficiency programs are shifting their focus away from CFLs to promote the stocking and sale of LED replacement lamps. At the same time, lessons learned from negative consumer experiences with early-stage CFL programs continue to inform program implementers. Coupled with the diversity of state and local requirements for appliance efficiency, these considerations have driven an abundance of voluntary performance standards, from new ENERGY STAR® requirements to the California Energy Commission's LED lamp quality specification. In this session, participants will hear first-hand accounts from program administrators addressing this shift from CFL to LED, and learn how their strategies to get customers to buy the more efficient light bulb have evolved. Participants will learn what recent market studies have found about whether the LED has really "gone mainstream," and discuss how these efforts are impacting their lighting program strategies and savings.

Discussion Questions:

- What approaches are programs taking to increase the market uptake of LEDs, and how do they differ from “traditional” CFL programs? For example: marketing taking the place of incentives; upstream programs taking the place of mail-in rebates; etc.
- How are the lessons learned from CFL programs about consumer acceptance factors and quality standards being applied now through program strategies that target LEDs? Do these lessons truly carry over? Why or why not?
- Is the market really “confused” by voluntary performance specifications, or are customers confused more generally by lighting sold at retail—and how can programs address these barriers?

*Financing Track**Coolidge***E2: Growing and Transforming Distributed Energy Markets**Moderator: **David Hill**, Vermont Energy Investment CorporationSpeakers: **Chris Cook**, Solar Grid Storage
Elaine Ulrich, United States Department of Energy
George Simons, Itron
Jessica Rackley, ICF International

This session will provide interactive discussion around assessments of the extent to which incentive programs and other forms of public policy have affected the transformation of distributed energy resource (DER) markets. Specific discussion areas include market potential and characterization, identification of market barriers and strengths, identification and description of state and federal policy influences, analysis of indicators and metrics that reflect the evolution of distributed energy markets, and an assessment of the sustainability of these markets in the absence of programs or policies.

Discussion Questions:

- What recent policy changes do you see as being the greatest drivers/barriers to DER market transformation in your region?
- Are there policies/initiatives/barriers at the federal level that are important to enable DER market potential?
- How do state, regional (RTO) and federal regulations and market structures need to evolve and at which level will the most significant changes be required?
- From your perspective, who have been the most influential market actors in DER market transformation?
- Which DER technologies (second to PV) seem to be transforming most rapidly and why? Conversely, which technology markets are struggling most and why?
- There are clearly technical, economic, and regulatory issues involved and they are inter-related, but if you were pressed which of these three is the most significant now....in 5 years....in 10 years and why?
- How do consumer interests and equity issues play out in an expanding DER market? What are the key issues and questions likely to arise?

5:30 pm – 7:30 pm**RECEPTION***T.M. Ballroom North/East***Wednesday, April 22****7:00 am to 3:00 pm****REGISTRATION***Registration A***7:30 am to 8:30 am****BREAKFAST***T.M. Ballroom North/East*

8:30 am to 10:00 am**CONCURRENT SESSIONS***Session 2A**T.M. Ballroom South***Regional Roundup**

Moderator: **Ed Wisniewski**, Consortium for Energy Efficiency

Speakers: *National:* **Nick Dahlberg**, Consortium for Energy Efficiency
California: **Jan Berman**, Pacific Gas and Electric Company
Midwest: **Stacey Paradis**, Midwest Energy Efficiency Alliance
New England & Mid-Atlantic: **Susan Coakley**, Northeast Energy Efficiency Partnerships
Northwest: **Susan Stratton**, Northwest Energy Efficiency Alliance
Southeast: **Mandy Mahoney**, Southeast Energy Efficiency Alliance
Southwest: **Howard Geller**, Southwest Energy Efficiency Project
Texas: **Mike Stockard**, Oncor

This perennial session will explore notable changes to program funding, impacts, approaches and policy across various geographies of significance throughout the US. Summary results of CEE's ninth consecutive annual budgets and impacts report for the US and Canada will be presented. Assembled panelists will include a range of perspectives including those having the full spectrum of obligation and responsibility for program administration to those advocating for favorable state and regional efficiency policies. Panelists will be asked to comment on emerging trends, recent successes and developing challenges facing their respective organizations. Attend this session to learn more about the emergence of the Program Administrator industry and policy and program developments.

*Session 2B**T.M. Ballroom West***Evaluating and Modeling the Impact of Market Transformation Programs**

Moderator: **Iris Sulyma**, Research4Results

Speakers: **Robert Russell**, Navigant
Marvin Horowitz, Demand Research
Ken Tiedeman, BC Hydro

Analysis of the impact of social policies typically relies either on experiments or on structural equations. Experiments examine differences between randomly selected treatment and control groups, while structural equations model the determinants of the participation decision and the outcome variable using regression analysis. Analysis of market transformation relies instead on less transparent and less credible methods including consumer and supplier self-report surveys, expert judgment, or case studies. The purpose of this proposed session is to examine examples where rigorous analytical methods have been applied to market transformation, examine barriers to the use of rigorous evaluation methods, and suggest ways of overcoming these barriers and expanding the use of rigorous market transformation evaluation.

10:00 am to 10:30 am**BREAK***South/West Foyer***10:30 am to 12:00 pm****CONCURRENT SESSIONS***Session 3A**T.M. Ballroom South***EPA's Clean Power Plan: Pathways for Energy Efficiency in State Compliance Plans**

Moderator: **Rodney Sobin**, NASEO

Speakers: **Chris James**, Regulatory Assistance Project
Mark Wagner, Johnson Controls
Doug Lewin, The South-central Partnership for Energy Efficiency as a Resource

The EPA's proposed Clean Power Plan (aka "111(d)") offers a potentially transformational boost for energy efficiency programs. The Plan allows and encourages end-use efficiency as a compliance strategy and envisions opportunities and roles for both ratepayer and non-ratepayer programs. Under Section 111(d) of the Clean Air Act, states must develop compliance plans

showing how emissions reduction targets will be met. Development of compliance strategies will require collaboration among air regulators, utility commissions, state energy offices, utilities, and other energy efficiency service providers. This session will provide an overview of how energy efficiency programs and policies could be included and their energy savings (and resulting emissions reductions) can be counted for Clean Power Plan compliance. It will cover compliance plan components that state air regulators may need to consider possible roles of various regulators, utilities, program administrators, and other entities.

Session 3B

T.M. Ballroom West

Customer Engagement and the Utility of the Future

Moderator: **Harvey Michaels**, Massachusetts Institute of Technology

Speakers: **Michael Sachse**, Opower
Roland Risser, United States Department of Energy
Janice Berman, Pacific Gas and Electric Company
Austin Whitman, FirstFuel

Recent innovations posit that energy analytics, collective intelligence, two-way communication, and social networks are not only helpful but necessary to achieve the efficiency we need for numerous societal goals. This session will explore why and how efficiency program administrators have, or may use data-driven tools and connectivity to better engage consumers and help accomplish objectives such as:

- Energy/carbon transparency and disclosure – supporting social norms that may drive efficiency awareness and adoptions;
- Intelligent energy analytics – supporting control, sensors, calculation of efficiency potential or the value of efficiency achieved, and competitions
- Integrated processes for the relationship of grid modernization to the built environment - linking efficiency, demand response, renewables, electric transportation, and storage.

12:00 pm to 1:15 pm

LUNCH

T.M. Ballroom North/East

1:15 pm to 2:45 pm

WORKING SESSIONS

Zero Net Energy Track

T.M. Ballroom West

A3: Zero Net Energy from Coast to Coast

Moderator: **Cathy Higgins**, New Buildings Institute

Speakers: **Sandra Henry**, ComEd
Abhijeet Pande, TRC
Peter Turnbull, Pacific Gas and Electric Company
Bill Updike, District of Columbia Department of the Environment

This session will explore the current transition of the commercial buildings market to Zero Net Energy (ZNE) from a policy and program perspective. A quick look at the current trends in building types, characteristics and locations of ZNE buildings will set a framework for the panel. The session will then explore the work in California, Massachusetts, and New York that is at the forefront of this market transformation and offer lessons in different strategies to get to a Zero Net Energy building stock. Panelist will discuss the common drivers that facilitated the early adoption of ZNE policy and programs and how they addressed early and ongoing hurdles. The group will then dive into a facilitated dialog to compare and contrast these policy and program paths, reflecting differences in geography, built environment, and priorities.

Discussion Questions:

- What are the primary drivers of ZNE uptake? If they are different across locations, why?
- What methods and mechanisms has your organization used to advocate for net zero as a policy and/or program priority? How did you help 'make it happen' and what stakeholders were involved in the process?
- Who is 'leading' in your area: Early Adopter design firms or owners or government/utilities? What is their motivation to 'lead'?

- How does your program or policy address the critical role of post-occupancy in terms of operations and tenant impacts toward outcome-based performance?
- What have been the key barriers to date and how can these be addressed nationally?

*Residential Products Track**T.M. Ballroom South***B3: Transforming Residential Appliance Markets: Integrating Product Standards, Labeling, and Incentives**Moderator: **Ken Tiedemann**, BC HydroSpeakers: **Timothy Sutherland**, Navigant
Iris Sulyma, Research4Results
Allan Lee, Cadmus
Alice Rosenberg, Consortium for Energy Efficiency

Residential appliances and lighting are major consumers of electricity, and a variety of tools including voluntary standards and labeling, financial incentives and minimum energy performance standards have been used to encourage consumers to purchase energy efficient appliances and lighting. The purpose of this study is to: (i) present case studies of comprehensive programs which have integrated these tools to transform residential appliance and lighting markets; and discuss a number of questions in light of the evidence and insights from these case studies. The traditional market transformation paradigm involves several steps: (i) technology development; (ii) voluntary standard setting and labeling; (iii) marketing and financial incentives; and (iv) minimum energy performance standards. Emphasis will be placed on changes in key outcome variables including total sales, market share of the energy efficient product, and product prices.

Discussion Questions:

- How successful has the traditional paradigm (see above) been in transforming residential appliance markets? Where has it been successful? Where has it been less successful?
- Does the traditional paradigm need to be redefined or changed in light of changes in residential appliance markets and possible changes in the regulatory environment? How should it be changed?
- What should be the focus of residential appliance market transformation activities over the next five years? Which products should be emphasized?
- What should be the key metrics for tracking market transformation (customer awareness, customer purchase intent, trade ally awareness, stocking behavior, sales, prices, market share, others)?

*Program Strategies Track**Harding***C3: Exemplary Agricultural Energy Efficiency Programs and Repeatable Keys to Success**Moderator: **Amanda DeGiorgi**, Consortium for Energy EfficiencySpeakers: **Craig Metz**, EnSave
Robert Russell, Navigant

While agriculture's share of total US direct energy consumption is overshadowed by that of other sectors, heavy seasonal loads and outdated end-use technologies make certain agricultural operations prime candidates for participation in energy efficiency programs. An increasing number of program administrators are devoting more resources to developing tailored offerings for agricultural customers, some of which leverage industry trends towards data analysis and process automation. Dedicated program involvement, leadership, and collaboration with industry and government partners are necessary in this sector to build awareness among farmers who are otherwise reluctant to make improvements without assurances of success from trusted third parties. This session will highlight ways to enhance the effectiveness of energy efficiency programs targeting agricultural operations. The speakers will discuss topics such as successful marketing and delivery methods, partnerships with extension services, government, and other industry stakeholders, and the technologies or end uses with the greatest potential for cost-effective energy savings.

Discussion Questions:

- Who are the key partners (industry supply chain, government, institutions, etc.) in delivering a successful agricultural efficiency program and what are the strategies for collaboration?

- What are examples of successful marketing, outreach, and educational strategies developed specifically to target agricultural producers?
- What are the biggest barriers or challenges that agricultural efficiency programs face in implementation, delivery, and increasing participation?
- How are agricultural customers identified?
- How does the seasonal nature of agricultural production affect program delivery, time frame, and choice of agricultural sectors to target?
- Which operations or sectors offer the greatest and most cost-effective potential for energy savings and at what level are those savings?
- Which energy efficiency, demand response or distributed generation solutions work the best with these issues?

*Data and Evaluation Track**Hoover***D3: Exploring Real-time Measurement and Verification (M&V)**Moderator: **Robert Kasman**, Pacific Gas and Electric CompanySpeakers: **Ethan Rogers**, American Council for an Energy-Efficient Economy
Charlie Ellis, EnergySavvy
Badri Raghavan, FirstFuel
Robert van Buskirk, Lawrence Berkeley National Laboratory

This session will explore the role that new data analysis strategies and methods are playing in the evaluation industry. Measuring and reporting energy savings as they happen can allow for faster and more cost-effective M&V and also enables new energy efficiency opportunities and real-time program adjustments that can capture higher savings. Speakers in this session will present on current projects using real-time M&V, the current and potential benefits of emerging automated M&V technologies, the drivers and barriers to uptake of these tools and practices, and the role of automated M&V in supporting market transformation initiatives.

Discussion Questions:

- What, if any, technology and/or regulatory barriers exist that must be overcome to realize the full value using ICT to produce real-time M&V?
- What are some of the key types of real time M&V information that might be available in the best of all possible worlds?
- What are some technical methods that we might be able to use to help mitigate some of the privacy issues around real time M&V?
- What are some of the ways that real-time M&V could change the way energy efficiency is bought, sold, and utilized?
- How can we go beyond sampling to an automated M&V methodology that is reliable, low cost, universal and scalable?
- How can real time M&V be used as a tool to determine grid level impact of EE programs?

*Market Transformation Strategies**Coolidge***E3: The Future of Energy Efficiency in Industry: How Will the Industrial Internet of Things Accelerate Market Transformation?**Moderator: **Jess Burgess**, Consortium for Energy EfficiencySpeakers: **Mary Burgoon**, Rockwell Automation
Al Hildreth, General Motors
Tom Pagliuco, Merck & Company, Inc.

According to McRock Capital, “The Industrial Internet of Things (IIoT) is the next wave of innovation impacting the way the world connects and optimizes machines. The IIoT, through the use of sensors, advanced analytics and intelligent decisioning, will profoundly transform the way field assets connect and communicate with the enterprise.” The IIoT is an integral part of emerging concepts including the digital oilfield, advanced manufacturing, grid automation, and smart cities. In this session, a speaker from the industrial automation and controls industry will help us envision the future by describing the current state of the IIoT and its implications for industrial energy performance. A panel of respondents will then comment on the roles of policymakers, program administrators, and the industry can play to help achieve future market transformation goals in the industrial sector.

Discussion Questions:

- What are the implications of IIoT on industrial energy efficiency?
- How much can IIoT improve energy performance within factories across the United States?
- What is the incremental cost and benefit of these technologies for industrial customers?
- What are the major challenges industrial customers and IIoT providers face in advancing this market?
- What role should federal, state and local programs play to help accelerate adoption of IIOT technology?
- How can local energy efficiency programs get credit toward their goals by helping industrials adopt this technology?
- What models can we draw from to put this opportunity into context?

2:45 pm to 3:00 pm**BREAK***South/West Foyer***3:00 pm to 4:30 pm****WORKING SESSIONS***Zero Net Energy Track**T.M. Ballroom West***A4: The Role of Energy Codes in Getting to Zero Net Energy Buildings**Moderator: **Ryan Colker**, National Institute of Building SciencesSpeakers: **Jim Edelson**, New Buildings Institute
Duane Jonlin, City of Seattle
Patrick Eilert, Pacific Gas and Electric Company

Building energy codes and policies established and enforced at the state and local level help drive large scale transformation of the new construction and existing building retrofits market. As efficiency programs and research organizations continue to identify and develop pathways to achieve net-zero energy buildings, it is imperative that codes and policies recognize and incorporate technological advancements and market progress and facilitate achievement of community-wide energy performance goals. This session will focus on innovative approaches in code development such as the use of a reach code (or stretch code) to identify a path forward and support industry leaders and the introduction of outcome-based codes to move beyond design strategies to realization of actual, measured results. Compliance is important in realization of code and policy goals and new assurance methods are emerging. The panel will further consider how, through the code development process, energy efficiency programs are working with code developers to ensure mutually beneficial results and the achievement of long-term energy use goals.

Discussion Questions:

- How can programs designed to create supportive environments for code adoption/enforcement capture the savings attributed to such code adoptions and enforcement?
- How do program administrators work with authorities having jurisdiction to increase code compliance?
- What is the role of a reach code in influencing the next iteration of the building code? Can a reach code be used to show the acceptance of more stringent requirements?
- What is the path forward for development and implementation of outcome-based codes and what policies (including benchmarking) are needed to support the transition?

*Residential Products Track**T.M. Ballroom South***B4: Minding the Gap: Can Residential Efficiency Programs and ENERGY STAR® Keep Pace with the Market?**Moderator: **Nick Lange**, Vermont Energy Investment CorporationSpeakers: **Abigail Daken**, United States Environmental Protection Agency
Janice Berman, Pacific Gas and Electric Company

Energy efficiency programs have been established to accelerate adoption of cost-effective efficiency measures and transform markets. Despite this focus on market change, many residential efficiency program stakeholders are challenged by the increasing complexity and rate of change in the marketplace of energy-related products and services. This session will examine

this issue through the lens efficiency industry efforts to support the energy savings potential of connected climate controls (e.g. smart thermostats). We'll hear from the "bleeding edges" of product specification efforts and forward-thinking energy efficiency program administrator activities about how the market's speed and trajectory are driving changes to program design and implementation.

Discussion Questions:

- Given that the efficiency of connected devices like smart thermostats exist both as a discrete product and adjunct services, what are the opportunities and challenges for programs?
- How have programs and specification organizations grappled with this fast moving and highly competitive landscape (e.g. proprietary technologies, non-interoperable eco-systems, data transfer protocols, etc.)?
- How can connected functionalities improve efficiency programs' EM&V capabilities and maximize the potential of market advances?
- What EM&V approaches are compatible with conducting assessments on the potential and actual impact of our support efforts?
- How does the energy efficiency industry view the next ten years compare to the market's view? What steps should we be taking now to fully realize the benefits?
- What tools from the efficiency program tool box (e.g. incentives, marketing, training, trade ally support, etc.) can be used to influence this market as it develops? Where should they be focused? What new tools may be required?

Program Strategies Track

Harding

C4: Beyond the 5%: Solutions for Small and Medium Commercial Retrofits

Moderator: **Mark B. Stutman**, Consortium for Building Energy Innovation, The Pennsylvania State University

Speakers: **Dennis O'Connor**, The United Illuminating Company
Nicole Carpenter, Vermont Energy Investment Corporation
Ben Rivers, National Grid

Commercial buildings that are less than 50,000 square feet represent just over half of the commercial floor space (not including malls). Utilities and contractors are both stepping up efforts to address the efficiency needs of this sector. This large volume of the commercial building market often has higher energy use due to factors such as reduced capital investment in improvements, lack of owner focus on physical building upgrades, and absence of targeted energy efficiency program offerings. This session will share strategies that are actively being used to improve efficiency retrofits for the small and medium commercial building industry, including program design approaches, targeted end measures, innovative incentive structures, and financing mechanisms.

Discussion Questions:

- Why is that small and medium commercial building market so critical to meeting portfolio efficiency targets?
- What are the key challenges necessary to overcome in order to achieve wide scale savings across this market?
- What are the primary barriers to date, and what program delivery approaches are successfully overcoming these challenges?
- How do you market to these owners and decision makers?
- Which efficiency measures are most relevant and readily adopted for smaller and medium-sized commercial buildings?

Data and Evaluation Track

Hoover

D4: Better Quality Data and Confidence through Ratings

Moderator: **Jennifer Allen**, Midwest Energy Efficiency Alliance

Speakers: **Jayson Antonoff**, Institute for Market Transformation
Marshall Duer-Balkind, Government of the District of Columbia
John Supp, DC Sustainable Energy Utility

Jurisdictions around the world are implementing comprehensive energy performance policies for homes and buildings which include assessments, benchmarking, rating, reporting, and disclosure. However, how effective are these policies in advancing energy efficiency and giving it a competitive advantage? Best practices are emerging that address various topics, including

benchmarking and rating methodologies and tools, data quality, training and support mechanisms, stakeholder engagement, data analysis, and use in program and policy development.

Discussion Questions:

- What efforts have been made to engage other sectors to take advantage of benchmarking information? How do you see this changing over the next few years?
- How do you see benchmarking affecting workforce development? What other ways has benchmarking improved the economy?
- When should regulatory policies be introduced, what market segments should they cover, and what is needed to ensure high compliance?
- When talking about clean and valid data, what role (if any) do you see data verification influencing data integrity?
- How do we ensure that the data is of high quality? What happens when the public believes that the data is low quality? How will that affect market transformation?
- Now that we have data, what is the best way to put that data to work?

Market Transformation Strategies Track

Coolidge

E4: Demand Response Market Transformation: From Programs and ISO Markets to the Business Models of the Future

Moderator: **John Taylor**, Consortium for Energy Efficiency

Speakers: **Susan Covino**, PJM

Dan Delurey, Association for Demand Response and Smart Grids

Russ Morton, EnerNoc

Smart buildings with intelligent energy demand management are an emerging strategy for demand response, as utilities seek new customer value assets as well pathways to a future smart grid and a low-carbon energy economy in the face of new regulations like those of the Clean Power Plan from EPA. Interplay between supply and demand across a 24-hour period requires new tools, especially once intermittent solar and wind generation require homes and businesses to modulate demand for grid stability. Utilities are reimagining their role as smart grid advancements influence what energy planning and management may be capable of; in addition, Independent System Operators (ISO's) are using capacity markets to incentivize and reward the use of demand response. Functionally, utilities are considering how demand response works with their customer value and grid modernization strategies, with specific consideration of the utility ties to related equipment – web controlled thermostats, whole house, lights, electric vehicle charging control, and services, such as demand response and ancillary load aggregation networks.

Discussion Questions:

- What is Demand Response of the future – is it a utility control or customer control behavior based-real time price strategy? What other stakeholders play key roles in how it evolves?
- How can integrated processes and connected, DR-ready products support the relationship of grid modernization for the built environment: linking efficiency, demand response, renewables, and electric transportation?
- How will we move from a summer peak demand focus to include load modulation in real time?
- Can demand response compete with other grid stabilization technologies, such as grid-scale battery storage?
- How can utility services related to building controls, ancillary services, and information and communications technology (ICT) add to the business model viability of distribution utilities?
- What communication pathways and functionality will be required of energy consuming products to support demand response of the future?

We look forward to seeing you at the 2016 Market Transformation Symposium in Baltimore, Maryland, March 20-22.

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