Dear **ACEEE Industrial Summer Study Participants**,

Thank you for attending the 2017 ACEEE Summer Study on Energy Efficiency in Industry. We hope you enjoyed the conference and had plenty of opportunities to engage your peers during the **Action Sessions.** As you recall, the Action Sessions followed and were informed by formal sessions. They focused on topics within the three conference focus areas: Programs; Technology and Analytics; Policy and People.

Action Sessions Overview

Track A: Programs

Industrial energy efficiency programs continue to evolve in connection with the changing energy and utility landscape. The Programs Action Sessions will explore the current challenges and opportunities for advancing industrial energy efficiency across North America and will dig deeper into participant-refined topics including:

- Marketing and industrial customer engagement to improve industrial energy management.
- How do Strategic Energy Management programs need to evolve and what are the key market drivers?
- Industrial Program Best Practices: Participants can suggest and select discussion groups from a menu of concepts, in order to share ideas and translate success stories to your own program.
- Other topics suggested by conference participants.

Action Session Leaders: *Nick Leritz, NEEA; Patsy Dugger, CB&I*

Track B: Technology and Analytics

Data analytics and new technologies continue to provide opportunities for significant energy reductions in industrial energy use. The Technologies Action Sessions will tackle the challenges faced with implementing energy management improvements including:

- How can the wealth of data be used to further energy management programs as costs for sensors, connectivity, IOT and data visualization decreases?
- What is the relationship between people and technology and how can we enable change through the use of technology?
- What is preventing organizations from applying the most promising new technologies and how can we reach the full potential of technological advances?

Action Session Leaders: *Cindy Muller, MDA Systems; Robert Greenwald, Prism Engineering*

Track C: People and Policies

With the U.S. transition away from federal climate policies such as the Clean Power Plan and the Paris Climate commitments, and potentially large cuts to federal energy efficiency programs on the horizon, what can states and regions do to maintain momentum for industrial energy efficiency? The People and Policy Action Sessions will explore the challenges and opportunities for advancing industrial energy efficiency through policies at the state/province or regional levels. In the three Action sessions, we will dig deeper into topics such as:

- State and regional policies to support strategic energy management, CHP and other innovative industrial DSM programs;
- State recognition programs for voluntary energy efficiency goals and achievements;
- Avoiding new state opt-out policies, and;
- Other topics suggested by conference participants.

Action Session Leaders: *Graziella Siciliano, US Department of Energy; Neil Kolwey, Southwest Energy Efficiency Project*

Action Sessions Schedule-at-a-Glance

Date	Time	Room	Focus Area	Title	Facilitators
Tues. Aug. 15	**6:15pm - 7:00pm**	Colorado E	All	ACEEE Action Session Overview: Help Shape the Week's Action-Focused Sessions!	Chad Gilless, Stillwater Energy Kevin Wallace, BC Hydro
Weds. Aug. 16	**10:30am - 12:00pm**	Colorado AB	Programs	Industrial Program Best Practices: Sharing and Translating Success Stories to Your Own Program	Patsy Dugger, CB&I Nick Leritz, NEEA
		Colorado CD	Technology/ Analytics	How the wealth of data can further energy management programs as costs for sensors, connectivity, IOT and data visualization decreases	Robert Greenwald, Prism Engineering
		Colorado GH	Policy/People	Removing Policy Barriers to Strategic Energy Management and Other Innovative Industrial Energy Efficiency Strategies	Neil Kolwey, Southwest Energy Efficiency Project Graziella Siciliano, US Department of Energy
Thurs. Aug. 17	**10:30am - 12:00pm**	Colorado AB	Programs	The Next Generation of SEM Program Design: Help Shape the Future	Patsy Dugger, CB&I Nick Leritz, NEEA
		Colorado CD	Technology/ Analytics	The relationship between people and technology: how can we enable change through the use of technology	Robert Greenwald, Prism Engineering
		Colorado GH	Policy/People	Recognizing and Supporting Voluntary Actions by the Private Sector	Neil Kolwey, Southwest Energy Efficiency Project Graziella Siciliano, US Department of Energy
	3:30pm - 5:00pm	Colorado AB	Programs	Marketing and Industrial Customer Engagement to Improve Uptake in Industrial Energy Management	Patsy Dugger, CB&I Nick Leritz, NEEA
		Colorado CD	Technology/ Analytics	The full potential of technological advances: What prevents organizations from applying the most promising new technologies	Robert Greenwald, Prism Engineering
		Colorado GH	Policy/People	The Future of U.S. Climate and Energy Policy: Challenges and Opportunities for Industrial Energy Efficiency	Neil Kolwey, Southwest Energy Efficiency Project Graziella Siciliano, US Department of Energy
Fri. Aug. 18	**10:30am - 12:00pm**	Colorado E	All	Call to Action: Outcomes from Conference Action Sessions	Chad Gilless, Stillwater Energy Kevin Wallace, BC Hydro

Track A: Programs Action Sessions Key Insights and Actions

Facilitators: Patsy Dugger, APTIM Nick Leritz, NEEA

- Session 1:
  - **Issue:** Industrial Program Best Practices: Small-Medium Businesses (SMB) Program Strategies
  - **Problems:**
    - Shortage of energy managers
    - Staff are always busy. Not enough people or people with the right expertise
    - Availability of capital and lack of a formal business processes to evaluate opportunities
    - Lack of sophisticated automation systems to simplify data gathering and analysis
  - **Solutions/Actions:**
    - Develop streamlined processes, simplified calculators and analysis tools for highly repeatable measures, minimize handoffs, leverage vendors, and utilize e-learning resources
    - Identify SMB Case Study Programs –e.g., Rocky Mtn. Power, SCG, Energy Trust, Bonneville Power, small SEM, etc.
  - **Issue**: Industrial Program Best Practices: Tackling System Interactions and Complex Projects
  - **Problems and Opportunities:**
    - Complex projects with system interactions, as well as mega projects (5-30 GWH) can generate significant savings but are difficult to develop, and challenging to measure through traditional M&V practices.
    - Customers often require information on how an efficiency project will affect throughput and production process in order to calculate ROI.
    - Customers need to understand how to prioritize work.
    - Champions need help selling projects internally
    - Implementers are challenged to find projects that are not free riders
  - **Solution/Action:**
    - Work with customers to identify projects early
    - Leverage both top-down calculations and bottom-up engineering estimates for M&V
    - Identify successful mega project approach case studies
- Session 2:
  - **Issue:** The Future of Strategic Energy Management (SEM):
    - Summary: SEM programs can become the "Wrapper" for comprehensive customer engagement and for customers to manage their energy.
  - **Opportunity:**
    - To leverage SEM engagement to support more comprehensive energy solutions – electrification, DR, DER, etc.
  - **Solutions/Actions:**
    - Study simpler "wrapper" programs, i.e.: combining capital and O&M
    - Identify or generate case studies of SEM programs successfully integrating non-EE strategies.
    - Create working group (NY REV, CA IDER, Utah) to survey programs and ask for volunteers to advance this topic

- **Issue:** The Future of SEM: North American SEM Collaborative
- **Problem/Opportunity**:
  - Need to share best practices and leverage resources on program designs (and more) nationally
- **Action:**
  - Develop a national collaborative and resource sharing platform
  - Identify and recruit broader national stakeholder engagement
  - Develop funding model, structure and management approach
  - Survey participants in this event on their interests/funding/structure
- **Issue:** Workforce Education and Training
- **Opportunities:**
  - Existing partnerships and training programs can be leveraged
  - Take advantage of system expertise, both book smarts and street smarts.

- Session 3:
  - **Issue:** Industrial Engagement and Marketing: Leveraging National resources
    - Summary: Discussed how to make the most of DOE, EPA, and various national customer associations.
  - **Problems/Resources:**
    - There many lost opportunities because utility EE and national EE programs do not coordinate as much as they could.
  - **Solutions/Actions**:
    - Solutions Mapping between local utility programs and national tools/platforms
    - Communication Initiative between Federal/Utility to support coordination between utility programs and national resources
    - National/Global Customer Market research that involves large national customers and associations
  - **Issue:** Industrial Customer Engagement and Marketing: Corporate Responsibility/Branding
  - **Problem:**
    - ISO-9000, -26000 and -50000 are not intimately related.
    - The benefits of energy efficiency are not properly recognized by customer service, shareholders, investors, and insurance companies.
    - Customer Service Representative (CSR) officers can have perception that sustainability is more materials/recycling oriented
    - There are potential connections between ISO-26000 Corporate Social Responsibility and ISO-50001
  - **Solutions/Actions:**
    - Develop Ranking indicators for investors -LEED, DOE/National Programs, or ISO 50001 or 50001 ready
    - Identify/Explore pathways for energy to be a baseline/category for environmental certification programs
  - **Issue:** Industrial Customer Engagement and Marketing: Leveraging Community/Municipal/Smart City Initiatives
  - **Problem/Opportunity:**
    - Industrial customers can be engaged to support municipal climate action Initiative, industrial community relations, workforce education and training
  - **Solutions/Actions:**
    - Improve communication on the value of industrial efficiency for jobs and economic development

        - Find/propagate case studies of community initiatives with industrial facilities, economic development, workforce development/community colleges.
    - **Issue:** Industrial Customer Engagement and Marketing: Non Energy Benefits (NEBS)
    - **Problem/Opportunity**
        - Non-energy benefits (NEBs) are often more important than energy cost savings: e.g., Employee satisfaction, safety, productivity, product quality, O&M, and environmental
    - **Solutions/Actions:**
        - Develop NEBs research projects
        - Capture data on and create a database of sector specific NEBs: i.e. Collect/communicate efficiency's impact on productivity
    - **Issue:** Industrial Customer Engagement and Marketing: Modernizing EE Engagement Platforms for a New Generation
    - **Opportunity:**
        - Leverage social media and phone-based monitoring apps to develop community forums to improve employee engagement
    - **Solutions/Actions:**
        - Investigate white papers and research reports on the use of social media
        - Utilize resources such as BECC and AESP conference papers
        - Explore leveraging universities and focus groups to potential outreach tools

Track B: Summary of Action Sessions Analytics & Technology Stream

Facilitator: Robert Greenwald, PEng, MBA Prism Engineering Ltd

- Session 1:
    - **Issue:** Data Analytics and Technology Collecting Data
    - **Problem:**
        - How can we collect data and get it into useful tool?
    - **Solutions/Actions:**
        - Start with what information you NEED before investing in metering, loads of data collection and analytics
    - **Issue:** Data Security and Data Sharing
    - **Problem:**
        - Even if we not are concerned about the security of energy data, we need to make sure an EMIS system is not a backdoor into an organization.
        - What other info can we gather at the same time as energy data and how can we use it?
        - What are useful metrics to compare plants to each?
    - **Solutions/Actions:**
        - Create data exchange protocols to facilitate consistency in data streams for use by analytic tools.
        - Investigate the possibilities of developing methodologies to compare industrial plants such as using ideal energy use as a comparison to actual (LBNL process benchmarking, Benchmark Energy Factor (BEF))
    - **Issue:** Data Visualization
    - **Problem:**
        - Employees need visualization of energy consumption in order to optimize plant operations.
    - **Solutions/Actions:**

        - Keep it simple, directed to a specific audience and with clear understanding of what action should occur. Show progress with arrows or symbols.
        - Develop best practice guide for data visualization (if none exist)
- Session 2:
    - **Issue:** Getting Buy-In from operators
    - **Problem:**
        - How do we make operators comfortable with technology changes?
    - **Solutions/Actions:**
        - Show operators how the change fits into what they are currently doing and how it will help them. Ideally involve the operations team in the purchasing decision in the first part!
    - **Issue:** How much training do people need and what is the role of programs?
    - **Problem:**
        - Scope of worker training needs unknown
    - **Solutions/Actions:**
        - Provide routine, hands-on training until the desired functional performance is achieved. Example: quarterly coaching after process change has occurred.
    - **Issue:** Worker motivation
    - **Problem:**
        - How do we get operators to care about energy management when throughput and quality have priority?
    - **Solutions/Actions:**
        - Provide networking opportunities supplemented by online forums AND create the expectation that energy management is good management (norming strategy)
    - **Issue:** Driving Actions
    - **Problem:**
        - How do we capture improvements from automation when people override controls?
    - **Solutions/Actions:**
        - We need to design controls that meet the user requirement, allow flexibility, and that default to design.
        - Assign clear responsibility for operating within parameters.
        - Seek to understand the source issue(s) driving override decisions.
    - **Issue:** Making a linkage between Behavior and Technology
    - **Problem:**
        - We are making assumptions about human behavior when we design new technology. Are they the right assumptions?
    - **Solutions/Actions:**
        - The designer of a technology needs to have a clear understanding on how it will be used by the user. For example, a child can use an iPhone without a manual. Why do we make things so complicated?
- Session 3:
    - **Issue:** New Technologies and Issues Reliability
    - **Problem:**
        - How do we make the new technology robust and reliable?
    - **Solutions/Actions:**
        - Get feedback from early users and iterate designs
        - Plan new releases based on user feedback
    - **Issue:** Persistency

- **Problem:**
  - How do we ensure the savings persist?
- **Solutions/Actions:**
  - Build in predicted and actual performance tracking into the equipment
  - Build in accountability and feedback into operations
- **Issue:** Operations
- **Problem:**
  - How do you explain to the operators the benefits of the new technology?
- **Solutions/Actions:**
  - Have a clear key performance indicator (KPI), communicate it, and share it within the company (between sites) and externally to encourage healthy competition and maximize human capital.
- **Issue:** Staying Current
- **Problem:**
  - How does industry find out about the new technology?
- **Solutions/Actions:**
  - Use networks to keep up to date on opportunities
- **Issue:** Production
- **Problem:**
  - How do we overcome the fear of negatively affecting production?
- **Solutions/Actions:**
  - Identify likely risks and bring trusted expertise to communicate impact effectively. Tie non-energy
  - Identify likely risks and bring trusted experts to communicate the level of risk. Tie non-energy benefits to operational issues.

Track C: Policy and People

Facilitators: Graziella Siciliano, independent; Neil Kolwey, Southwest Energy Efficiency Project

- ### Session 1 – Demand Side Management (DSM) Programs and Policy
  - Summary: The discussion focused on state policy obstacles to innovative demand-side management programs and actions needed to remove these obstacles.
  - **Issue:** SEM Programs
    - Summary: Interest and investment in strategic energy management strategies and programs continue to grow. This breakout group identified some key obstacles to SEM adoption and implementation.
  - **Problem:**
    - The multi-year persistence of SEM, resulting from continuous improvement approach to energy savings, is incompatible with existing DSM program regulatory frameworks for measuring and quantifying energy savings.
    - There is not an agreed upon national “best practice” for M&V of energy savings from SEM.
    - Efforts to capture and share energy and non-energy benefits of SEM are limited.
  - **Solutions/Actions:**
    - Define qualitative and quantitative data needed to fully capture benefits of SEM for both business and policy community; and create a centralized effort to gather data and share on impacts from SEM.

        - Collect and disseminate information about existing SEM programs and existing methods to M&V energy savings.
        - Create a national SEM collaborative with representatives from major U.S. SEM stakeholders including business, academia, government, civil society etc. Working through collaborative, define national SEM best practices, efforts and resources in key areas where national collaboration is needed, such as:
            - Measurement and Verification of SEM Energy Savings
            - Centralized data gathering and sharing platform
            - Data collection tools such as database and case study templates
            - Guidance for Policymakers/Regulators on how to integrate SEM into DSM program regulatory frameworks.
    - **Issue:** Combined Heat & Power (CHP)
        - Summary: This breakout group discussed programs targeting CHP and the option of utility ownership of CHP.
    - **Problems:** Barriers to more CHP deployment and CHP programs include:
        - Shortage of capital to invest.
        - Third-party ownership of generation is not allowed in some states
        - Utilities generally want to own generation resources rather than let their customers generate.
        - Some state public utilities commissions (PUCs) view CHP as "fuel-switching", which they view negatively.
        - Standby rates that make CHP uneconomical.
        - Some states do not have an interconnection standard, which allows utilities to make interconnection more difficult and expensive.
        - Unclear what the carbon benefits are, or how they will change with a changing generation mix.
        - Difficulty quantifying resiliency and other grid benefits.
        - Difficult to get a reasonable price for any exports of power to the grid.
    - **Solutions/Actions:**
        - Encourage (where allowed) third-party investment and ownership or leasing of CHP systems.
        - Educate regulators about the opportunities of utility ownership of CHP. The IRP process could be one opportunity. CHP TAPs could share examples of utility CHP ownership.
        - Suggest to PUCs allowing utilities to include CHP as an eligible DSM measure and in integrated resource planning.
        - Develop a set of best practices for standby rates and share this with other states and regions (There is already an acceptable model for interconnection standards). Collect case studies of good examples and examples that prevented deployment.
        - Develop better quantification of benefit streams, including carbon and grid benefits. Look to some of the leading states/provinces such as New York, CA, and Ontario.
        - Join forces with other behind the meter renewable (solar) advocates to argue for reasonable feed-in tariffs or price for wholesale sales of excess power.
- Session 2 – Voluntary Programs
    - Summary: We discussed how can local, state or national voluntary programs (separate from utility programs) advance industrial energy efficiency or climate/clean energy goals, participants divided into two groups. The first group focused on identifying the key elements of best practice voluntary energy efficiency programs for industry. The second group focused on key areas of research needed to engage industry on voluntary programs.

- **Issue:** Best Practice Voluntary Programs
  - Summary: The group identified the key elements of successful voluntary programs and discussed how to make such programs more successful.
- **Challenges and Problems:**
  - It is challenging to get upper management support for investing in energy management and to elevate the importance of energy efficiency within corporate sustainability reporting.
  - It is challenging for companies and sectors to set goals and track progress.
  - Too many companies are not aware of the tools and technical assistance available through voluntary programs.
  - There is a "clutter" of existing voluntary programs. Customers can have difficulty identifying which ones are the best.
- **Solutions/Actions:**
  - Social pressure and competition can drive participation.
  - Appeal to upper management by making a connection between energy efficiency and competitiveness or risk management.
  - An organization like ACEEE could create a scorecard that ranks the existing voluntary programs. This scorecard could consider programs available at the national level, such as DOE's Better Plants.
  - People often feel you get what you pay for. Charging a small fee may help grow participation in training, networking and recognition programs.
- **Issue:** Motivating Industry Engagement in Voluntary Programs
  - Summary: This group focused on the challenges in engaging industry. They shared examples of innovative models for industry engagement, and identified areas of needed research and collaboration to empower managers of voluntary programs to increase the success of their recruitment efforts.
- **Challenges and Problems:**
  - Program managers need more information about what motivates industry. They need to better tailor recruitment efforts and messaging to take into account the following questions:
  - We need to know where individual companies (and perhaps sectors) look for leadership in energy innovation and efficiency
  - We need a better understanding of the source(s) of the pressure to "go green" or become more sustainable.
  - We need a better understanding of how companies integrate energy efficiency into their broader business strategies.
  - How can program stakeholders identify the non-energy business benefits of their programs?
- **Actions:**
  - Sector-based recruitment efforts such as engaging industry associations to help build trust and tailored programs.
  - Peer-to-peer events where industry leaders, or "first movers," can interact and share their experience with voluntary programs. This could motivate others to participate in the programs.
  - Identify strategies that companies have used to create and integrate robust corporate sustainability programs in their daily operations.
  - Create a centralized data gathering and sharing platform on non-energy benefits from energy efficiency

        - Create a guidance document outlining successful outreach and recruitment strategies for industry. Include examples and case studies.
- Session 3 – How States can Continue Momentum on IEE and Carbon Goals
    - Summary: Given the current lack of federal support for climate action and for energy efficiency, states will have to take the lead. We broke into two groups to discuss how progressive states – those with state-level carbon goals and more progressive energy efficiency policies and goals – can continue to advance; and , how "challenging" states – those states with less support for energy efficiency and probably no carbon goals – can benefit from the activities of progressive states.
    - **Issue:** Progressive states
        - Summary: Progressive states are challenged to continue their progress and serve as models/leaders for other states
    - **Problems:**
        - In some cases, the cheap price of renewables can challenge the need for more energy efficiency.
        - We need best practices on how to evaluate energy savings and cost-effectiveness of EE programs such as SEM.
        - We need better EE programs for industrial customers served by Coops and municipal utilities.
    - **Solutions/Actions:**
        - Continue to reach out to small and medium-size industrial facilities.
        - More integration of water conservation and energy efficiency within water and wastewater treatment plants/systems.
        - Create collaborations between New England (RGGI) and western (WGGI) states.
        - Where it makes sense, create programs to electrify some industrial loads. Examples: shipping ports, loading and unloading operations.
        - Continue improving and add more SEM programs to increase both O&M and capital savings.
        - Bring IEE perspective to state policy discussions around climate change goals at NARUC and NASEO gatherings.
    - **Issue:** Challenging States
        - Summary: This breakout group discussed strategies that could be effective at increasing investment in energy efficiency in states and regions where policies promoting energy efficiency, clean energy and climate change mitigation are either limited or under threat.
    - **Problems:**
        - Getting our messaging right: energy efficiency, clean energy, sustainability are "dirty words." Need to emphasize non-energy benefits.
        - Using the right messenger: program managers are not always the best people to communicate the value of energy efficiency.
    - **Solutions/Actions:**
        - Avoid more opt-out policies by
            - Improving industrial EE programs
            - Improving outreach to industrial customers.
        - Make greater investment in marketing and communications.
            - Create collateral materials.
            - Organize events that target key decision makers

        - Communicate the value of energy efficiency according to local priorities (e.g. economic development, job creation, etc.)
- Create more networks of industrial companies sharing best practices, and recognition programs.
- Recruit trusted messengers like industrial leaders to promote IEE.
- Conduct a survey of states with opt-out policies and analyze motivation of industries that have opted-out and impacts.