



NORTHWEST INDUSTRIAL
STRATEGIC ENERGY MANAGEMENT
COLLABORATIVE

SUMMER 2016



SEM Collaborative Newsletter

Northwest Strategic Energy Management (SEM) practitioners continue to lead the nation in SEM program implementation and customer engagement.

NEEA's Commercial and Industrial SEM Infrastructure project is an initiative to support Northwest SEM – to expand programs and achieve deeper savings.

Within the Infrastructure initiative, NEEA supports two communities of practice: The Northwest Industrial SEM Collaborative and the Commercial SEM working group. This newsletter is intended to provide status updates for a number of ongoing initiatives, and opportunities for SEM practitioners to engage with peers to advance SEM in the Northwest.

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It's Time to Register

for the Northwest Industrial SEM Collaborative 2016 Fall Workshop

Tuesday, October 11

8am-4:30pm

Embassy Suites Portland, OR

[Register Here](#)

Workshop Overview

The 2016 Fall Workshop is a unique opportunity to collaboratively discuss and learn how to enhance SEM programs or implement new programs across the region. The Workshop will provide both deep engagement in SEM progress during the past year and opportunities to work on the most important issues facing SEM practitioners.

1. What do SEM practitioners want to accomplish or explore this year?
2. How can SEM stakeholders work together to advance SEM to the next stage?
3. What could result from the Collaborative's work?

Workshop Agenda

8-9am	Coffee/Breakfast and Networking
9-9:15am	Welcome and Introduction
9:15-10:15am	What's Hot – What's coming, changing, and shaping our work
10:15-10:30am	Break
10:30am-12pm	What's Cool – Leading innovations in SEM nationally
12-12:45pm	Lunch & Networking
12:45-1:30pm	NW SEM Research Agenda
1:30-3:30pm	Urgent Issues in SEM
3:30-3:45pm	Break
3:45-4:15pm	What is a Collaborative?
4:15-4:30pm	That's a Wrap – Summary and next steps
4:30-5:30pm	Networking & Social Hour



Market Watch

What's Hot in SEM?

We asked members of the Industrial SEM Collaborative Leadership Team (LT) to tell us what they are most excited about in the SEM field.

We asked: What is most exciting in SEM right now?



Kim Crossman, Energy Trust of Oregon

Energy Trust's industrial SEM offering has been provided to almost 200 medium to large industrial sites in the past seven years, with 20-35 new sites joining each year since inception. In 2015, this introductory SEM offering was tuned and standardized to drive the best outcomes for new SEM participants, and renamed Core SEM. In 2016, we are designing and launching our Continuous SEM offering for graduates of Core. As we try to continuously improve and develop our program, we rely on our interactions with peers in the SEM Collaborative to learn from other peoples' experiences. We also have benefited from joining forces to gather information or collaboratively solve complex issues arising in SEM programs. My team has three research topics at top of mind right now, where getting better information would help us with program design, implementation, outcomes and evaluation. We look forward to engaging with Collaborative members who think these are juicy questions – let's work on it together!

1. What is the persistence of O&M measure savings? How does adoption of SEM affect the persistence of O&M measure savings? What is an appropriate measure life for claimed O&M savings under varied SEM program designs?
2. The flip side of the O&M question: What is the effect of SEM on capital project completion and persistence of savings from capital projects? Assuming that research finds an increase in savings from and persistence of capital projects at SEM sites, how can we best count the positive influence of SEM on capital projects when we consider SEM market effects/evaluation factors?
3. What we will try to learn through our Continuous SEM offering the next 3-5 years: What does the best continuous SEM offering for medium – large industries (best = highest customer satisfaction and savings) look like? In particular, what does it look like within the ecosystem of the Production Efficiency program framework? Over time, how are the structure and outcomes of the program affected by having 200+ of the most active participants successfully practicing SEM and being paid for operational performance/ energy savings on an annual basis? How will we need to change to realize this opportunity?

Nick Leritz, NEEA

SEM as a field gets more exciting as program offerings evolve and methods are refined, especially here in the NW where there is such concentration of programs and practitioners. I encourage all SEM practitioners to contemplate and engage in meaningful dialogue on current topics, so we can move faster and have deeper impact. As the number of North American sites practicing SEM surpasses 500, the most exciting topic for me is the growing opportunity to use data and analysis to refine offerings. One related opportunity is a number of forthcoming SEM program evaluation results expected in

2016. I'm excited to learn what some experienced program designers, practitioners and evaluators have learned and how it will strengthen and influence the future of SEM. Additionally, I remain hopeful about what we might learn from analysis of a large group of sites aggregated data on topics like persistence of savings and energy management practices, how results vary by size and type of company, impact of employee engagement and... I could go on. What are the Collaborative member's thoughts on these topics?

Chad Gillless, EnerNOC, Inc.

What's most exciting in SEM? It's all exciting! But if I have to pick one thing, it is the constantly improving organizational commitment, participation, and accountability around energy that is attributable to SEM. Practitioners are leading amazing workshops, deploying outstanding employee engagement tools, developing impressive energy models, and accomplishing some solid savings. However, we still have many of the same challenges where customer organizations don't send all of their leaders to energy strategy sessions,

or their participation drops off over time, or they don't hold their direct reports accountable for energy actions, which then causes those persons to let energy slide. I'm hearing about program managers and my fellow peer consultants using techniques to get to the root of this and drive some real organizational change at the top. This is big. And recognizing this as a challenge, we know that we can do a good deal more on it, which is exciting.

Erik Holman, Cascade Energy

SEM interest and new program planning (and launching!) is growing nationally. Our region continues to be looked to as a leader in industrial SEM implementation, and interest is very high on elements emphasized by our region's ongoing programs and the NW SEM Collaborative forward-looking work elements, including:

- Sound M&V practices which are defensible/verifiable through impact evaluation – over a multi-year engagement period.
- EMIS, EMIS, EMIS – a core element in a number of new programs, aimed at linking people with actionable data and visualization tools. The value of this information as part of SEM is gaining momentum.

- Targeted sector SEM delivery - cohorts comprised of operations staff from similar plants has proven to be a very effective delivery method. Applied in several sectors, this approach maintains the peer-learning benefit of the traditional SEM cohort, while providing greater opportunity to overlay conventional SEM training with focused technical topics. As a result, OM&B opportunities rise to the surface earlier and in greater number.

We are also excited at the prospect for deeper, process related savings elements, which become more accessible over time with the above elements in place.

Heidi Javanbakht, The Cadmus Group

During the past year, Bonneville Power Administration, Cadmus and SBW have been collaborating to conduct research into how best to evaluate SEM energy savings achieved by industrial facilities. We've been exploring and comparing different regression modeling methods and deriving algorithms for calculating the confidence intervals around savings results. This research will improve future

evaluations of SEM programs and will inform updates to the IPMVP Option C protocol, the DOE Uniform Methods Project SEM protocol, and the ASHRAE guideline for Measurement of Energy and Demand Savings. It's exciting to be involved in these efforts to ensure that they align and provide consistent guidance on how SEM programs are evaluated.

Sergio Dias, Sergio Dias Consulting

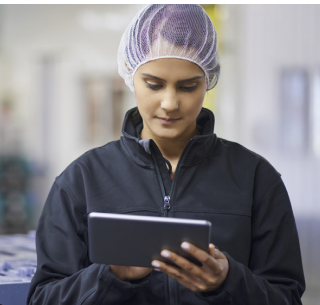
On July 19, the California Public Utilities Commission published a proposed decision to set up the framework for the state's Energy Efficiency Rolling Portfolio process. This proposed decision, which also supports a bill that changed the CPUC's default baseline policy to be based on "existing conditions" for existing buildings, will likely be voted on at the Commission's next meeting on August 18.

The proposed decision has a long discussion on industrial and specifically on industrial SEM but a couple of key points from the proposed decision relevant to industrial SEM are:

1. Although the CPUC proposes to not apply "existing conditions" to industrial projects in general, they do propose to allow using existing conditions "for strategic energy management programs, which may include certain behavioral, retrocommissioning, and/or operational characteristics."

2. In the document, the CPUC directs "the utilities to modify their continuous energy improvement programs or develop new programs to offer a robust strategic energy management program, using a statewide program design."

For those of you who have followed California's SEM programs, if the proposed decision is adopted it will provide a massive change for industrial SEM in the state. It opens up the possibility for industrial SEM programs to claim savings and provide incentives and directs the utilities to offer industrial SEM to their customers. The full proposed decision can be found [here](#).



SEM Hub Update

Summary of Progress

NEEA's SEM Hub is taking shape and NEEA needs your input to guide development of the first phase.

The first 10 months of Hub development included extensive stakeholder engagement to identify the needs and wants of SEM program personnel, delivery partners, and customers.

SEM Hub will include only the best available resources (and those to-be-developed) in service of SEM program development and expansion in the Northwest. The proposed list of resources to include in the Hub includes:

1. NEEA Toolbox Talk Cards
2. NEEA Energy Management Assessment tool/website
3. NEEA Online-SEM
4. Core set of NEEA/ETO/BPA implementation tools/templates
 - Online SEM resource library
 - ETO Opportunity register
 - Recruitment screening tool
 - Incentives strategies and levels
5. Commercial SEM resources including BetterBricks
6. Case studies/videos page organized by business type
7. Links to best available national resources including M&V and Evaluation tools and methodologies

Next steps include refining the list of priority resources and designing the initial iteration of the Hub for testing later in 2016.

We will also be developing a list of tools and resources to develop through the Infrastructure initiative, to be housed on SEM Hub. These may include:

1. Standardized framework and terminology.
2. SEM Delivery Guides for utility programs and implementation partners
3. Two sets of SEM tools: A streamlined tool set for smaller organizations or organizations just starting with SEM, and a more complex tool set for larger or more advanced end users.
4. Specific resources that support the SEM framework including:
 - Human resources and “train-the-trainer” material for maintenance activities.
 - Specific purchasing guidelines by technology.
 - Energy mapping tools.
 - Project registers and progress tracking tools.
 - Comprehensive training guides for creating Monitoring, Targeting & Reporting (MT&R) models.

Want to learn more or get involved in ongoing testing and review? Contact Warren Fish at wfish@neea.org.



Commercial SEM Spring Workshop

What We Learned

Collaborative assessment of the regional opportunity for Commercial Strategic Energy Management.

On June 8, NEEA hosted a workshop with Pacific Northwest utilities and Bonneville Power, to assess opportunities specific to Commercial Strategic Energy Management. Commercial SEM (C-SEM) has been a growing part of utilities' increasing focus on holistic energy management services, and NEEA is supporting a dedicated working group that compliments the Industrial SEM Collaborative.

C-SEM Workshop participants focused on learning from each other about successful approaches to strategic energy management with commercial customers. Some utilities have a rich history with SEM-like programs, including PSE's Resource Conservation Manager (RCM) program, which has paved the way for the new Bellevue Urban Smart business-engagement initiative. Other utilities are just getting started and can build on regional best practices.

The key takeaway from the workshop is that utilities are committed to working together – to regional collaboration for the purposes of learning and establishing consistent approaches to customer engagement, implementation, and savings calculations. It's clear that there are savings to be acquired – how to do so cost-effectively and consistently is still largely unexplored territory.

Workshop participants discussed different approaches for different sectors: Large institutional building use-types – municipal, education, and hospital sectors – are more natural fits for SEM than commercial office and retail uses. Grocery represents substantial savings with a defined set of opportunities. Grocery and retail chains are challenging due to central ownership that spans utility programs – but also opportunities due to consistent building designs and consumption profiles that enable scalable approaches.

In addition to discussions of regional collaboration and leveraging different programs, participants shared crucial programmatic details, including most successful customer engagement strategies:

- Host feel-good events – parties, awards, frequent get-togethers
- Commit to high touch between provider and customer – more important than technical tools
- Build long-term relationships with customers – working with active customers who may be involved in other programs
- Financial incentives (checks!) are important

- Use cohort approach – cohorts keep customers engaged; ability to interact with other people from their industry and learn from those interactions to get better at their jobs
- Develop a sales pitch or marketing program that makes C-SEM formal and discrete
- Package C-SEM with other programs – holistic “suite-of-services” approach
- Use key accounts to help with recruitment
- Make it convenient – either close to or at customer location
- Use peer-to-peer learning via case studies and stories
- Engage chains & franchises and show what peers and competitors are doing
- Focus on making the energy champion (or whoever the customer lead is) look good at what they do – help them help you
- Deliver sales pitches at different levels of an organization



SEM Topic Teams

Ongoing Engagement Efforts

SEM Collaborative members share best practices and address current issues on 11 defined topics.

The 2015 Fall Workshop led to creation of 11 Topic Teams comprised of cross-disciplinary experts. Several Topic Teams produced immediate results; others have met continually and are working on some of our most important issues.

Topic Teams (created during the 2015 Fall Workshop)

1. EIS + SEM
2. Data Acquisition
3. M&V
4. Clean Power Plan
5. Ongoing SEM Challenges & Opportunities
6. CUSUM Says What?
7. Commercial SEM
8. Market Transformation
9. SEM & Regulations
10. Defining & Marketing SEM
11. SEM Persistence

Topic Teams are important platforms for ongoing collaboration throughout the year. **Want to get engaged or start one?** Contact Warren Fish at wfish@nea.org.

Following are key highlights.

SEM in the Clean Power Plan

This Topic Team formed to respond specifically to the Clean Power Plan, and quickly produced a set of recommendations to EPA regarding SEM measurement within CPP. The Team convened following the 2015 Fall Workshop and addressed how efficiency from reductions in energy intensity rather than consumption could be addressed within CPP. The team reviewed the M&V Guide and assessed how CPP might more explicitly support SEM. Comments were submitted in February 2016. The team may reconvene if and when final CPP guidance is released. The Team is also considering a function as an “SEM Policy SWAT Team” to address any policy issues that arise from the work of Collaborative members.

SEM and M&V

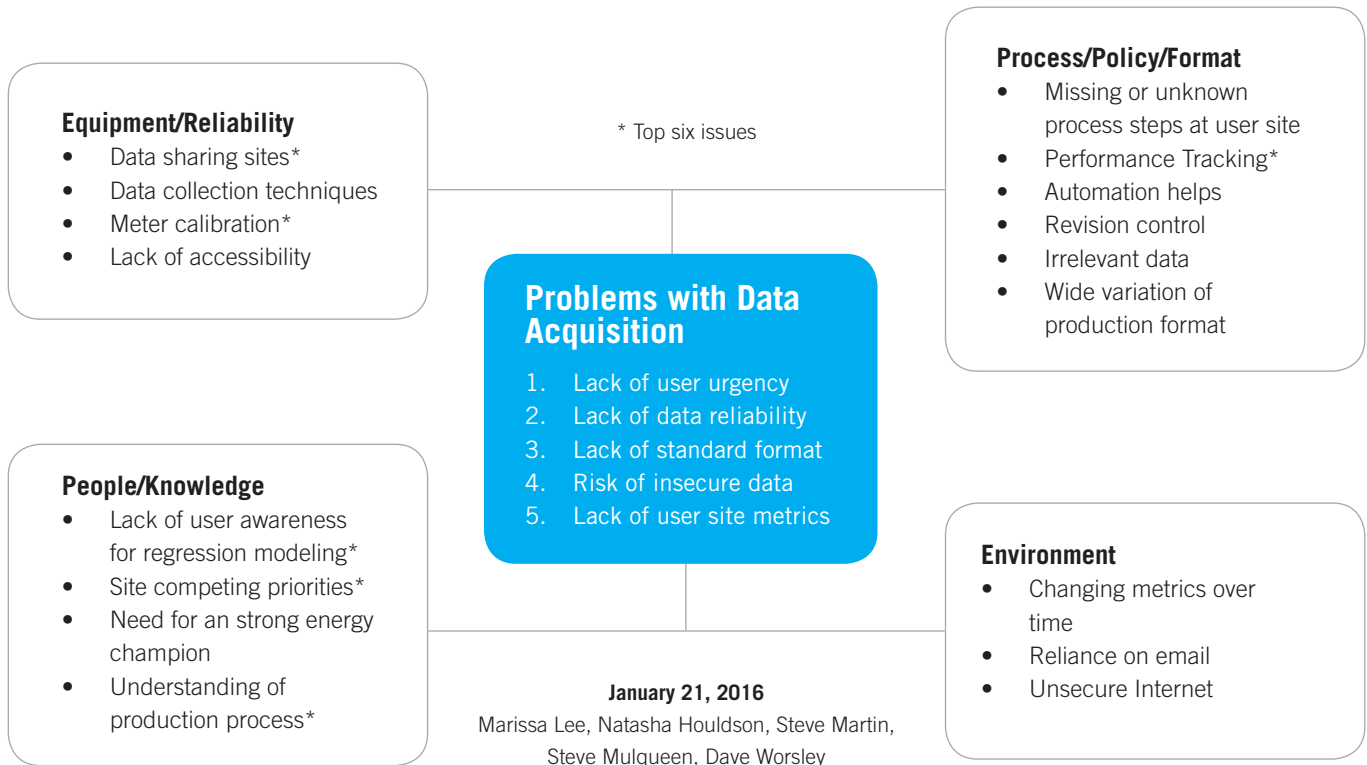
The M&V team met regularly since 2015 Fall Workshop and is into phase two of a project to test new M&V protocols for SEM. The Team first established a set of working principles to ensure that all participants would honor data confidentiality requirements, and then set up a process to use real data to test alternative M&V protocols for measuring facility-wide savings. The team set up “process elements” for each protocol required for 1. Building the model; 2. Estimating savings; and, 3. Usability. The team is currently reviewing protocols, with focus on the number of variables that should be used in each model; tracking and reporting; and model creation.

M&V Methods

1. Forecasting
2. Reduced Form Forecasting
3. Backcasting (DOE, BPA, SEP)
4. Chaining (DOE)
5. Mean Model (BPA, ETO)
6. Bottom-up (BPA)
7. KPI Bin (BPA)
8. Intervention Step (ETO)
9. Standard Conditions (SEP)
10. KPI Average
11. Bayesian/Gaussian

SEM Data Acquisition

The Data Acquisition Topic Team produced a [Findings Report](#) (published on Conduit) that addresses challenges of acquiring data for creation of linear regression and other energy models. The team developed a fishbone diagram (adapted below) to visually represent the top six issues in data acquisition. Model data comes in the form of 10-minute, daily, weekly, monthly or similar intervals. Production data is typically units per day, gallons per hour, board-feet, number of hours used per day etc. After identifying the top six issues denoted by asterisk (*), statements were created to describe the problems with data acquisition.



Ongoing SEM Challenges & Opportunities

This team's focus is on sharing topics for ongoing SEM engagement, to maintain a current and robust dialogue among Collaborative members that is responsive and dynamic. The team is building a forum to share and discuss the learnings, challenges, and opportunities in working with customers for multiple years. Ideas include:

1. Share details related to existing on-going SEM programs (i.e., multi-year engagements and beyond) such as:
 - Implementation structures/ approaches
 - Program design and strategies (Logic models, etc)
 - Regulatory and organizational context
 - Target markets
 - Marketing materials
 - Savings methodologies
 - Incentive levels
2. Provide a "Network of Designers" to support individuals on program needs such as:
 - Changes to existing programs
 - New program designs
 - Program issues and ideas
3. On a regular (monthly) basis, discuss and brainstorm topics listed above or topics such as:
 - Effect of SEM participation on Free ridership
 - Market transformation
 - Getting through major distractions



New SEM Resources and Best Practices

Looking for inspiration or a deeper dive into SEM? See below for resources fresh from our Collaborative Leadership Team.

1.

SEM in the News

1. Energy management in industrial facilities:
 - [Five critical factors for implementing an industrial energy strategy](#)
 - [Energy management efforts can yield recognizable benefits... If companies make them stick](#)
2. From the Spring 2016 edition of The Champion: [Energy managers: Reach out to the finance department](#)

2.

Energy Trust of Oregon

1. [Energy Champion feature on Arctic Glacier](#)
2. [ETO blog: Industry & Ag](#)
3. [Sierra Pine SEM case study](#)

3.

BPA Energy Smart Industrial (ESI)

1. Case Studies
 - [City of Vancouver case study \(SEM-HPPEM\)](#)
 - [Fitesa case study \(SEM-HPPEM\)](#)
 - [Fitesa video case study \(SEM-HPPEM\)](#)

2. Oregon Leaders Awards Case Study
 - [Stimson Clatskanie \(HPEM\)](#)
3. ESI ACEEE White Papers
 - 2013 ACEEE Summer Study: [Elements of Defensible Regression-Based Energy Models for MT&R in Industrial EE O&M Projects](#)
4. 2015 ACEEE Summer Study
 - [Promoting Reliability of Industrial SEM Savings Through Multi-Year Engagements](#)

4.

Cascade Energy

See the one-page resources at the end of the Newsletter, including embedded links to the full ACEEE white papers from the 2015 Summer Study on Industrial Energy Efficiency:

1. [DSM Participation Experience Enhanced](#)
2. [SEM Adoption](#)

The DSM Participant Experience Enhanced—How Energy Management Information Systems Impact Behavior-Based Programs

A 2015 ACEEE Summer Study paper and presentation by Brian Crumrine, Cascade Energy and Greg Baker, Efficiency Vermont.

Introduction

This paper draws on the experience of several behavior-based DSM programs highlighting successes, failures, and lessons learned.

Behavior-Based Programs and the EMIS

Cascade Energy is a program delivery partner for a number of utility DSM programs, including Energy Trust of Oregon, Efficiency Vermont, and Bonneville Power Administration’s Energy Smart Industrial (ESI). These programs all offer behavior-based components for SEM and technical operator coaching—with EMISs playing an important role in driving participant success in four important ways:

- EMISs support SEM and technical coaching programs by helping tracking energy performance so participants understand the impact of their improvements over time.
- An EMIS provides a central location for documenting and storing information.
- EMISs help SEM and technical coaching program participants connect actions to results.
- An EMIS can increase an organization’s awareness of energy efficiency and engage staff and executives in the energy management process.

DSM Program Manager Perspectives on Using an EMIS

- Although energy-use information is interesting, the dynamic display of energy model results is the biggest value-add of an EMIS
- EMISs offer a secure method of receiving, storing, and sharing data
- An EMIS fosters better and closer relationships with end users
- Making energy data flow into an EMIS can be hard, but it is getting easier
- Transmitting production data into an EMIS is critical, and often challenging
- Existing information systems (or models) affect the extent to which end users adopt EMIS

The Future of EMISs in Behavior-Based Programs

Program administrators shared their thoughts on using EMISs in behavior-based programs:

- Need to find ways to share EMIS information to engage a wider audience beyond a core team of “power users.”
- Collecting and analyzing critical sub-system data in an EMIS could result in discovering more opportunities to drive increased efficiency and yield higher energy savings.
- The EMIS should be well integrated into the SEM curricula to quickly and easily show different visualizations that illustrate and clarify SEM concepts.
- Continue to evolve EMIS modeling capabilities to enhance DSM program delivery.
- As utilities and end users become more involved in generating and storing data and saving and managing energy, the EMIS could become a key part of integrating and coordinating services around those processes.

Download the Complete Paper

[Access the full paper](#) at the 2015 ACEEE Summer Study on Energy Efficiency in Industry website

Accelerating the Adoption Of Strategic Energy Management Through Stakeholder Engagement

A 2015 ACEEE Summer Study paper and presentation by Chellie Jensen, Idaho Power Company, Martin Lott, Cascade Energy, and Layne McWilliams, Cascade Energy.

Introduction

An increasing number of utilities recognize the dynamic results SEM offers industrial facilities. In the spring of 2013, Idaho Power Company, and its contractor, Cascade Energy, began planning a Strategic Energy Management water/wastewater cohort offering under Idaho Power's Custom Efficiency Program. For this new cohort to be successful, a comprehensive approach to SEM would be necessary—one that considered municipal infrastructure planning cycles, compliance-driven operations cultures, and engineering design firms with traditional business models.

The Wastewater Industry Ecosystem

Municipal governments, engineering design firms, regulators, and operators are members of a market ecosystem. This community of well-meaning and methodical professionals rarely collaborates to manage growing energy costs, and, in fact, it is often the case that the actions of one entity will tie the hands of another.

The Wastewater Energy Efficiency Cohort

Idaho Power's wastewater energy efficiency cohort (WWEEC) worked with design engineers, plant operators, and regulators to integrate energy efficiency into capital budgets, engineering designs, and water resource recovery facility operations. The two-year program consisted of:

- Five mandatory workshops
- Energy management assessments at each plant
- Coaching on technical and organizational issues
- Onsite assistance to identify energy savings opportunities
- Energy management information system software
- Tailored coaching in the second year

Wastewater Operators Develop Trust and Gain Confidence

Rather than working only on specific projects, an effective W/WW sector specialist should represent the conservation program to the industry. W/WW sector specialists are more valuable as they become known in the region.

Regulators Communicate Support

WWEEC offered a rare opportunity for regulators to connect directly with the frontline of water resource recovery facility operation. It was as much a chance to get their message out as it was to hear and address operators' concerns.

Engineering Design Firms Gain New Perspectives

Engineering design firms are under pressure to keep design and initial construction costs down. System specifications often come at the expense of long-term energy efficiency. During the WWEEC workshops, engineering design firms were invited to attend and speak.

Municipalities Open Doors and Encourage Collaboration

Prior to WWEEC, Idaho Power energy efficiency engineering staff had limited relationships with its municipal public works directors, but after the workshops, city governments in Idaho Power territory began opening doors for the utility.

Download the Complete Paper

[Access the full paper](#) at the 2015 ACEEE Summer Study on Energy Efficiency in Industry website.