2019 Northeast Strategic Energy Management Collaborative Workshop

November 14, 2019

Giselle Procaccianti, Commercial and Industrial Program Manager, NEEP
David Lis, Director of Technology and Marketing Solutions, NEEP

Meeting Guidelines – Antitrust Statement

Throughout our meetings, participants shall comply with competition law requirements and shall not enter into any discussion, activity or conduct that may violate any applicable competition law. Should the meeting discuss matters that contravene competition law requirements, it is the responsibility of participants to notify the Moderator who will discontinue the discussion or close the meeting.

About NEEP

A Regional Energy Efficiency Organization

One of six REEOs funded in-part by U.S. DOE to support state and local efficiency policies and programs.

Northeast Energy Efficiency Partnerships

"Assist the Northeast and Mid-Atlantic region to reduce building sector energy consumption 3% per year and carbon emissions 40% by 2030 (relative to 2001)"

Mission

We seek to accelerate regional collaboration to promote advanced energy efficiency and related solutions in homes, buildings, industry, and communities.

Vision

We envision the region's homes, buildings, and communities transformed into efficient, affordable, low-carbon, resilient places to live, work, and play.

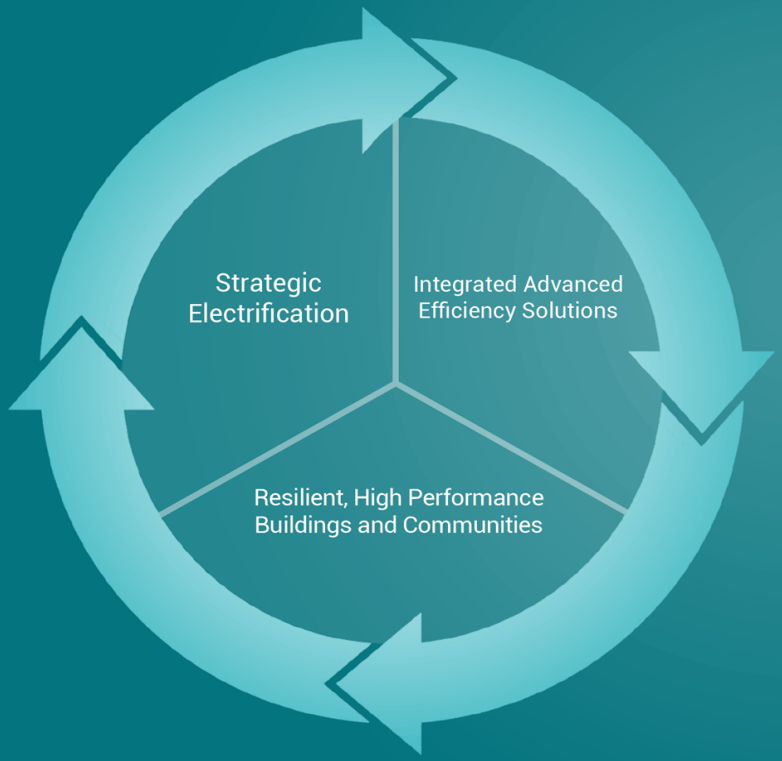
Approach

Drive market transformation regionally by fostering collaboration and innovation, developing tools, and disseminating knowledge

NEEP's Advanced Efficiency Strategic 2019-2021 Agenda

Advanced Efficiency Leadership Network

Assist the Northeast and Mid-Atlantic region to reduce building sector energy consumption three percent per year and carbon emission 40 percent by 2030 (relative to 2010).



NEEP Products & Services

- Events, Stakeholder Engagement, Learning Exchange
- Regional Market Transformation Strategies
- Research, Progress Tracking, Analysis, Reports, Case Studies
- Best Practice Guidelines, Tools, Technical Assistance and Resource Centers

Thank You to our Sponsors

Cascade Energy®

VEIC

Efficiency Vermont

Allies Network

Agenda

8:00 am - 9:00 am	**BREAKFAST AND NETWORKING**
9:00 am - 9:30 am	Welcome/Introduction/Ice Breaker *Giselle Procaccianti, NEEP; Todd Baldyga, NYSERDA*
9:30 am - 10:30 am	Regional SEM Program Overview *Jeff Hare, Cascade; Elizabeth Palchak, VEIC*
10:30 am - 10:45 am	**BREAK**
10:45 am - 11:45 am	The SEM Experience: A Customer's Journey *Kenneth, Scherrieble, Camden Group Inc.*
11:45 am - 1:00 pm	**LUNCH**
1:00 pm - 2:00 pm	National SEM Activities *Pete Langlois, U.S. DOE, Jeff Hare, Cascade*
2:00 pm - 2:15 pm	**BREAK**
2:15 pm - 3:15 pm	Opportunities to Accelerate the SEM Market *Attendee Driven*
3:15 pm – 3:30 pm	Debrief and Closing *Giselle Procaccianti, NEEP*

Insights from Northeast States Reflections and Projections

1. What was your greatest CEI/SEM accomplishment over the past year?

2. Based on your experience and lessons learned over the past years, what will you do differently re CEI/SEM program implementation next year?

Insights from New York

1. Peer-to-peer exchange: Usually, very little peer-to-peer exchange occurs naturally in the WWRF sector…. facilitated peer-to-peer exchange was very meaningful to cohort members.

2. More information from cohort members on the Value Proposition(s) of participating in SEM. Following are a few examples from current cohort participants:

   - Participating in the SEM program has helped us to realize the impact of right sizing equipment during design and refurbishment.

   - Participating in the SEM program has given the staff the opportunity to interact with and learn from operators in other facilities around the state, leading to new relationships and new ideas for use at our facility.

   - Our original SEM goal was to reduce enough energy at the plant to counteract the impact of the new facilities (800,000 kWh/year or approximately 2.5% of the electricity used at the plant). We exceeded this goal by achieving 5% reduction and are on-track to meet the Climate Action Plan goals.

More insights from New York

1. The biggest accomplishment is that we are currently running a third cohort and seeking approval to run additional cohorts through 2025. This was a pilot program initially (approval for 2 cohorts) so the fact that we've had enough positive feedback and interest to run additional cohorts is a huge success.

1. What we're learning is that our SEM program isn't a one-size fits all. There has been a lot of interest from entities that don't fit within the parameters of the cohort selection criteria, so we are exploring other ways to reach those customers and get them on the SEM path.

Insights from Vermont

1. Our greatest accomplishment was the successful implementation of CEI with a cohort of hospitals. It was a very specific customer group and allowed us to test our CEI approach and the SEM principles in new ways. We piloted the use of behavioral surveys and webinars to help our customers with their resource commitment to the program, and we modelled continuous learning and improvement.

2. We will continue to expand the internal team so that we can deliver on the principles and promise of CEI, while leveraging internal expertise and relationships across sectors.

Insights from Massachusetts and Rhode Island

1. SEM has been a positive engagement tool for customers and they value their relationship with Cascade.

2. We are currently in the process of determining the savings that Cascade is providing to customers and it unlikely that we will look to change how the program is implemented next year.

Insights from Connecticut

1. Re-designing the SEM process to establish it as ready to go to market.

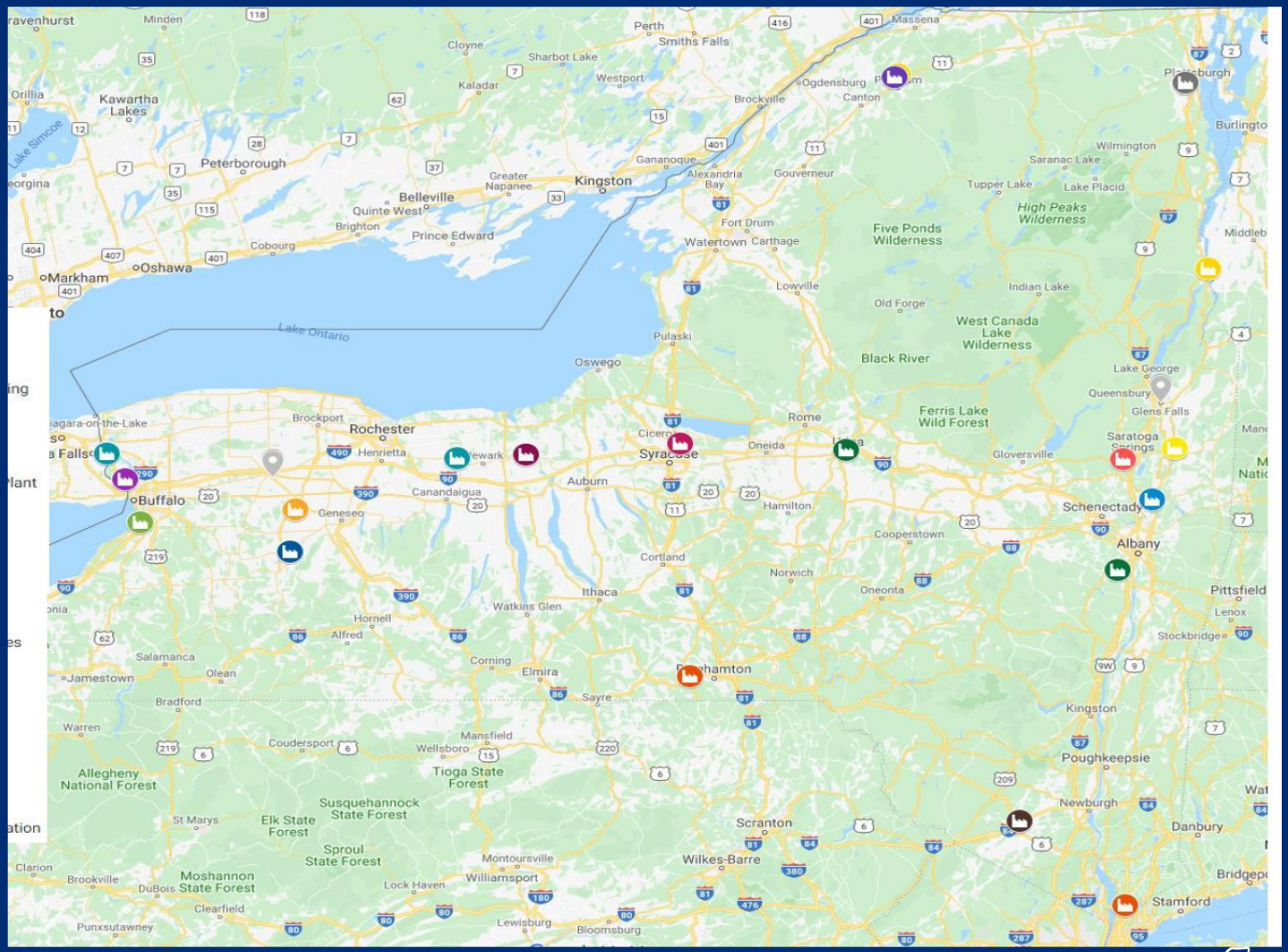
1. We are still in early stages and still learning about what works for customers and what we have to change. Our efforts going forward will require us to better define the value proposition of SEM and what value it brings. This is different from our RCX, O&M, PRIME, and BSC programs. There is some overlap and it can be confusing for our customers if we don't differentiate the SEM offering clearly.

New York's Strategic Energy Management Journey

Todd Baldyga
Director Industrial & Agriculture Market Development
NEEP SEM Collaborative Workshop, Albany NY
November 14, 2019

NYSERDA's SEM Program Timeline

- Commenced first Industrial Cohort with 8 facilities in September 2017
- Started new cohort each yr since; 7- 8 customers each
- Wastewater cohort- Completed its first yr in October 2019



NEW YORK STATE OF OPPORTUNITY. NYSERDA

NYSERDA SEM Findings

- Cohort 1: 6,132 MWh (3%), 23,199 MMBtu (6%)
- Cohort 2: 22,761MWh (5%), 11,167 MMBtu (6%)
- Cohort 1 WRRF: 13,090 MWh, 1,158 MMBtu (4.8%)
- EMA increase:0.4,0.45,0.56 avg factor increase

NYSERDA SEM Challenges

- Recruitment
- Timely Data Collection
- Scheduling (Large State)
- Confidentiality-Value Proposition-Market Transformation

NYSERDA SEM Successes and Testimonials

- *"I thought we were doing a good job before, but there were things we weren't even looking at."*
- *"This is a fraction of a Level 2 audit cost. And instead of empowering one guy, you've empowered your team. The results could be exponential."*
- *"The significant takeaway is that we are looking at energy differently and finding new perspectives to connect with more people. Now people are finally understanding the importance of energy and feeling empowered to help control costs."*
- *Thanks to this increased engagement, employee dependent efforts like their recent "shut it off" campaign have been successful. "I would walk through different areas and see the lights were off and the machines weren't running," "It was working."*

NY SEM 2020 and Beyond

- Wastewater Cohort 2 end of November
- Submission to Increase Industrial Cohorts, expand into Commercial
- Provide technical support for ISO 50001 Ready
- Pool of SEM providers in NY

NY SEM

- ACEEE Research Paper
  - Persistence of Energy Savings
  - Negative Savings
- Learning from Others-What is working/What isn't

Thank you !

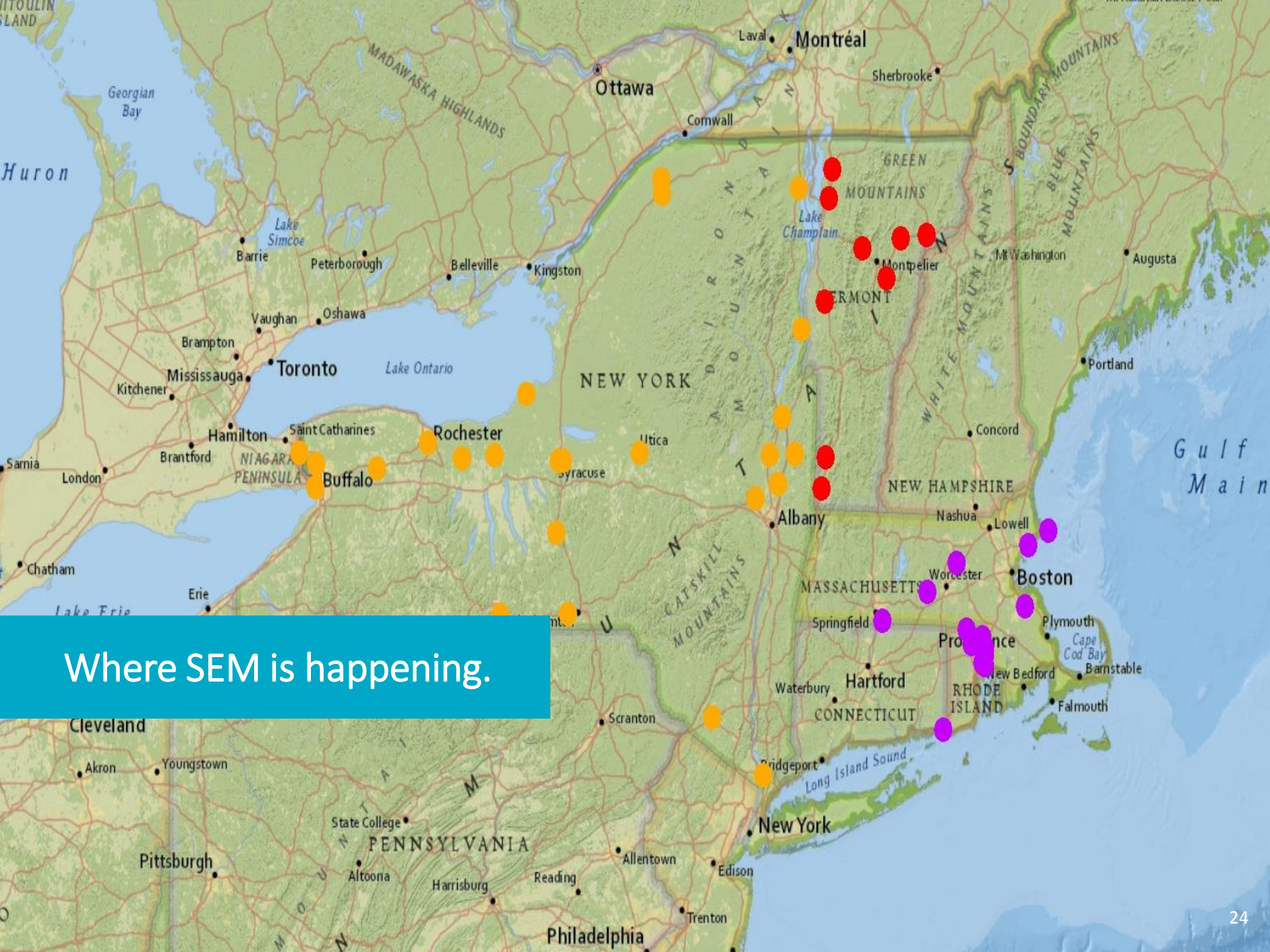
NEW YORK STATE OF OPPORTUNITY. NYSERDA

Cascade Energy®

NEEP
Strategic Energy Management Collaborative Workshop
Northeast Regional Highlights

Jeff Hare
SEM/Aquafficiency
Operations Manager

What are you doing?


Where SEM is happening.
Montréal
Ottawa
Toronto
Lake Ontario
Lake Champlain
NEW YORK
VERMONT
NEW HAMPSHIRE
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
PENNSYLVANIA
Albany
Boston
New York
Hartford
Buffalo
Rochester
Syracuse
Utica
Philadelphia
Pittsburgh
Cleveland
Lake Erie
Lake Simcoe
Georgian Bay
Huron
Long Island Sound
Gulf of Maine
ADIRONDACK MOUNTAINS
GREEN MOUNTAINS
WHITE MOUNTAINS
CATSKILL MOUNTAINS
MADAWASKA HIGHLANDS
NIAGARA PENINSULA
Laval
Sherbrooke
Cornwall
Barrie
Peterborough
Belleville
Kingston
Vaughan
Oshawa
Brampton
Mississauga
Kitchener
Hamilton
Saint Catharines
Brantford
Sarnia
London
Chatham
Erie
Montpelier
Mt Washington
Augusta
Portland
Concord
Nashua
Lowell
Worcester
Springfield
Plymouth
Cape Cod Bay
Barnstable
New Bedford
Falmouth
Waterbury
Scranton
Bridgeport
Allentown
Edison
Trenton
Reading
Harrisburg
Altoona
State College
Akron
Youngstown

Ideal SEM Participant

Motivated to change

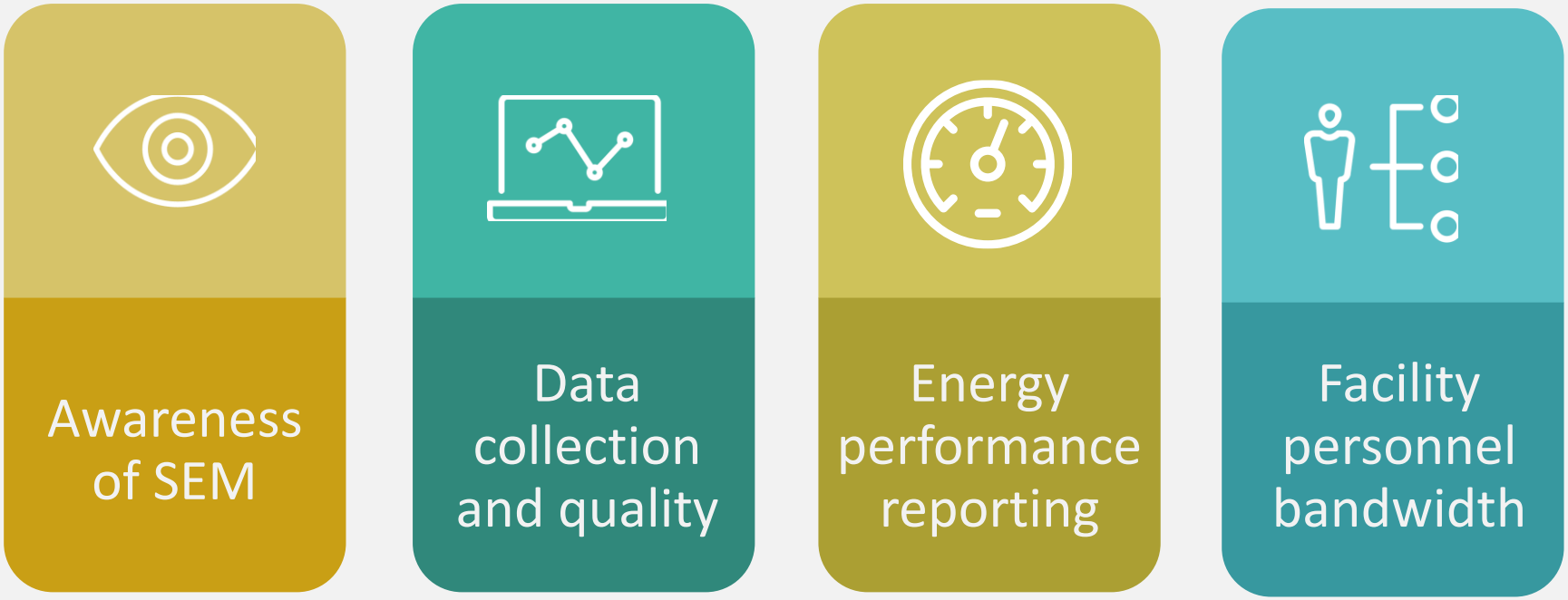
Resources to act

Clear roles/ responsibilities

Energy opportunities

Facility size

Challenges Encountered



Success Story

Lessons Learned

SEM works

Organic cultural change

Continued engagement

Utility program involvement

Claim savings

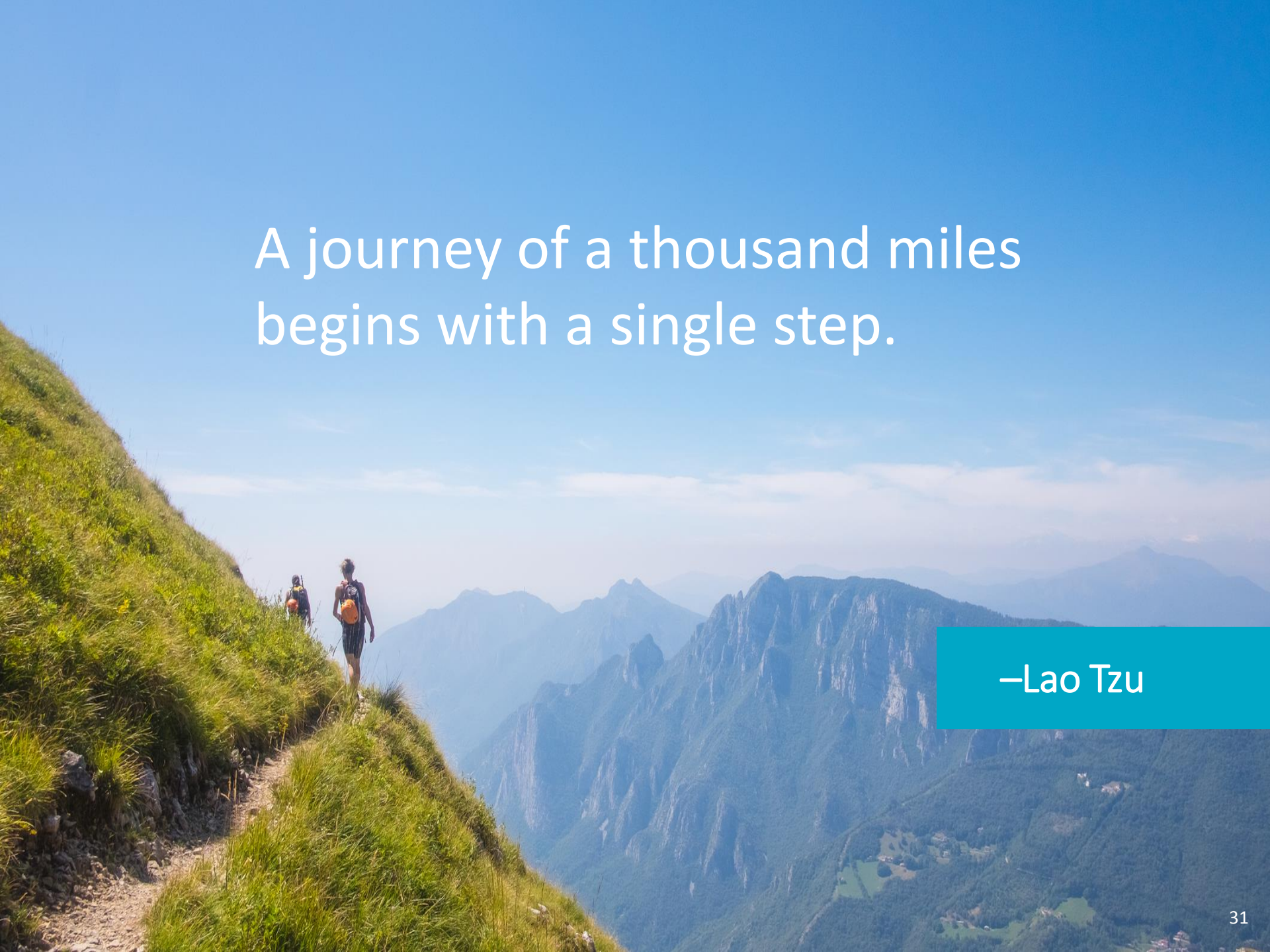
Future of SEM - Region

What does the future look like?

Bright, lots of opportunities

How can NEEP/others help to move SEM forward?

Integrate SEM into portfolio


A journey of a thousand miles begins with a single step.
–Lao Tzu

Thank you!

Jeff Hare

SEM/Aquafficiency Operations Manager

Cascade Energy, Inc.

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801-995-2982

Cascade Energy®

November 14, 2019

SEM Progress in Vermont and Beyond

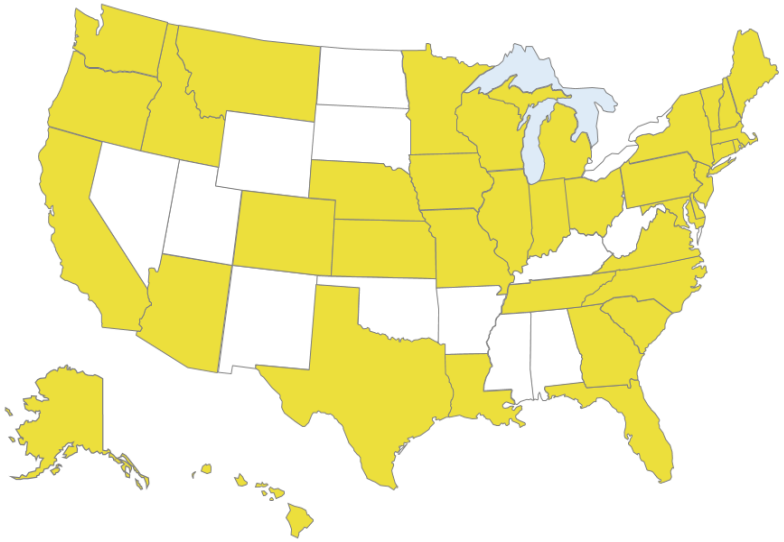
Challenges and Successes

Elizabeth Palchak, PhD, Consultant

VEIC

About VEIC

- Over 30 years of enhancing the economic, environmental, and societal benefits of clean and efficient energy use for all people



- Comprehensive approaches, high-impact results
- Energy efficiency, renewable energy, and transportation
- Program design and implementation
- Transformative policy, advocacy, and research

- Clients: utilities, government agencies, regulators, foundations, and advocates, colleges and universities

Efficiency Vermont

DC SUSTAINABLE ENERGY UTILITY

EFFICIENCY$MART

Major Initiatives

Efficiency Vermont

DC SUSTAINABLE ENERGY UTILITY

EFFICIENCY$MART

BERC Biomass Energy Resource Center

RENEWABLE ENERGY RESOURCE CENTER

Drive Electric Vermont

Commons Energy

Sustainability Benefits

Sun Shares

Elizabeth Palchak, Ph.D.

Efficiency Vermont

- Consultant, specializing in behavioral science and equity issues in the energy efficiency industry
- Expertise in behavioral program design for energy efficiency – working in Wisconsin, Tennessee, Washington D.C., Oregon, Vermont
- Leader in sustainability strategies for colleges and universities
- Supported the development of equity metrics guidance for the energy industry
- Adjunct faculty at the University of Vermont and Vermont Law School
- Lover of all things winter

VEIC

SEM Progress

- Efficiency Vermont's Continuous Energy Improvement (CEI) Program
  - Mixed Industrial/Healthcare/Hospitality Cohort
  - Technology focused cohort – Dairy Industry
  - Wastewater Cohort

- SEM Colleges/Universities

VEIC work in SEM outside Vermont

NYSERDA
- wastewater
- industrial

Hawaii Energy
- hospitality – 4 hotels
- employee engagement
- VEIC helped to improve current SEM program

∆ SEM is a significant time commitment

Hospitals

- 8 participants
- Wrapping up

+ multiple energy efficiency projects and capital upgrades across participant organizations

LED lighting projects converting entire hospital

mechanical insulators installed, increasing performance and efficiency

#6 fuel to compressed natural gas

+ survey sent to hospital employees found that 97% believed that saving energy is important

sent immediately prior to the employee engagement workshop

strong employee engagement efforts – Efficiency Vermont tabling, banners

Dairy Industry

- 2018

Δ modeling challenges

changes in baselines

unable to claim savings

\+ peer-to-peer engagement/learning

<u>Lessons learned</u>

Continued model maintenance is required

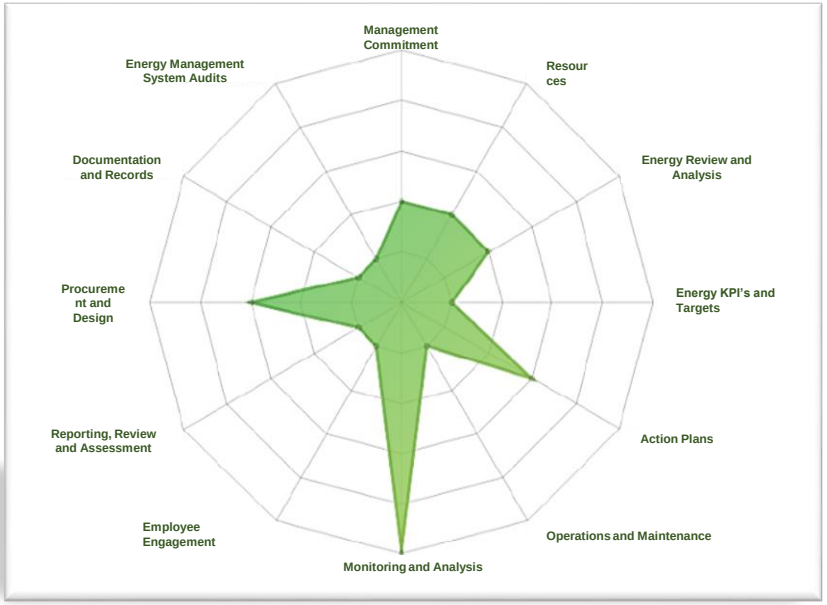
Internal Account Management (SEM coaches) for SEM participants should be minimized

Wastewater treatment centers

- 7
- Currently underway
- This is the first year that Efficiency Vermont can officially claim savings

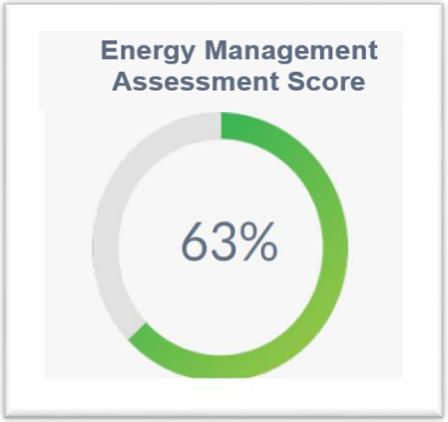
Self Assessment at start of SEM

September 2018



Rated 2 - Systemic

Self Assessment at end of SEM



June 2019 28%

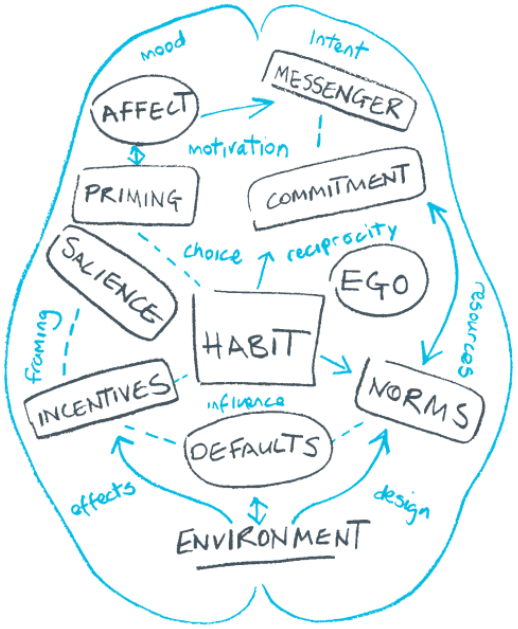
Rated 4 - Integrated

Unique to colleges and universities

- Students and faculty
- Multiple campus buildings
- Resource constraints**
- Commitments
- Tracking systems

Changing behavior on campus

Messenger
Incentives
Norms
Defaults
Salience
Priming
Affect
Commitments
Ego



https://www.bi.team/publications/mindspace/

VEIC

SEM for Colleges and Universities

- Learning with other colleges and universities
- Workshops and webinars
- **Student internships and competitions**
- In-person training for staff
- Modeling and analysis
- **Alignment with STARS credits**

www.uvm.edu

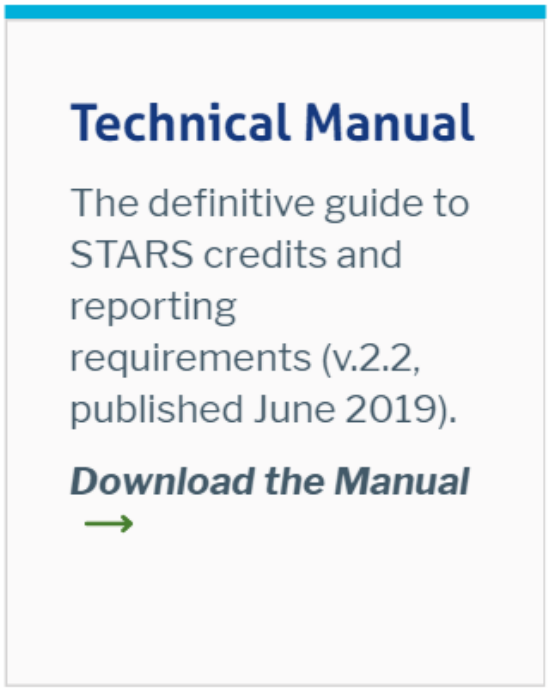
SEM in STARS

Based on review of STARS technical manual V2.2 Jan 2019

209 total possible points

39 points achievable thru SEM

16% STARS score are supported by SEM and applicable to full implementation of ISO50001 across a campus



SEM for Colleges and Universities

Continuous Energy Improvement with Efficiency Vermont

- 5 commitments/2 outstanding opportunities
- internship for students**
- custom approaches/high touch

SEM with DCSEU

- year-long cohort with 8 schools to provide support
- pitching SEM to schools individually
- workforce development and/or internships

Next steps

- Customize as much as possible
- Develop an employee engagement module that includes students
- Individual offerings versus full program
  - Treasure hunts
  - Behavior competitions

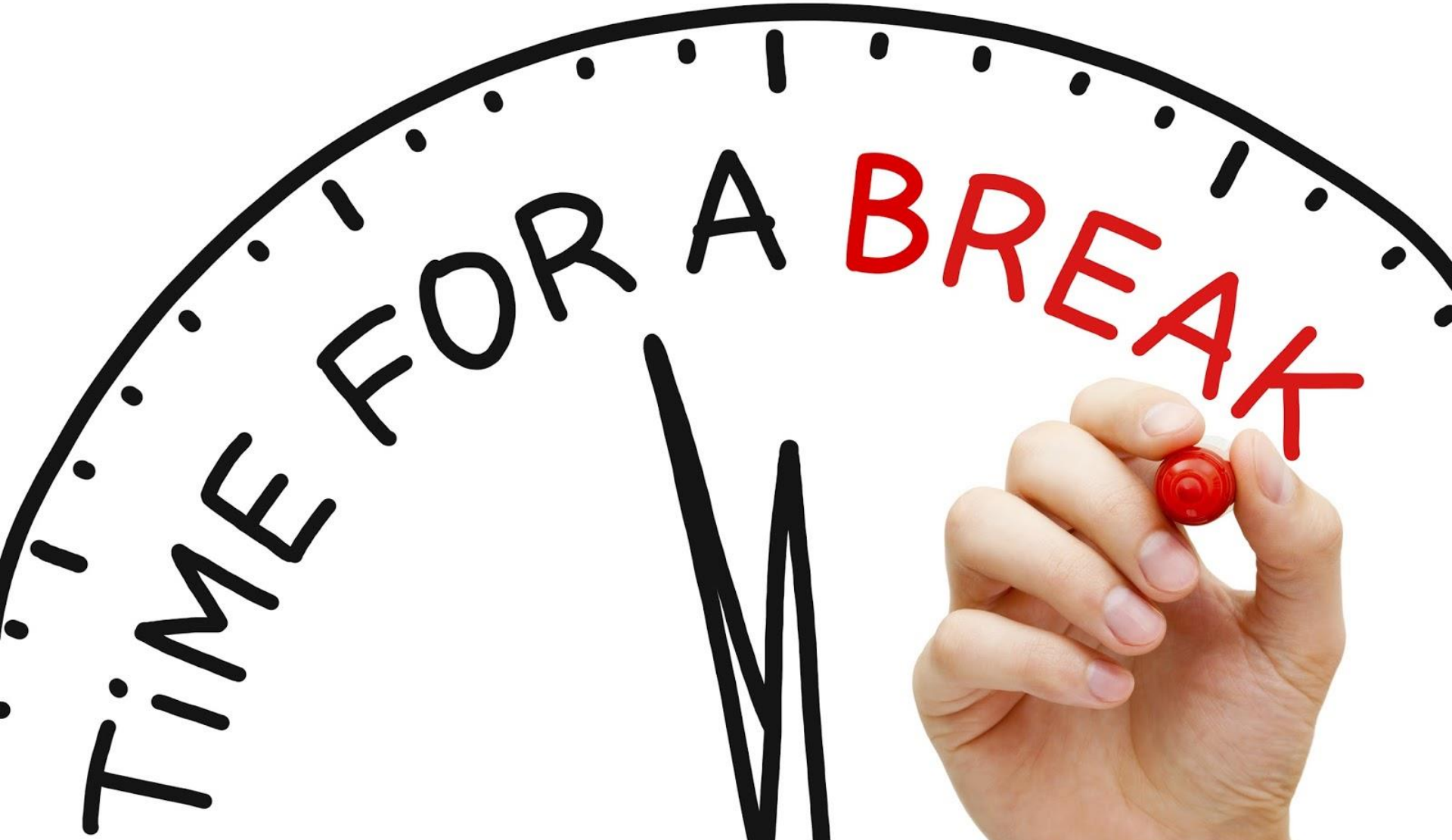
bennington.edu

Thank you!

Elizabeth Palchak

epalchak@veic.org

VEIC


TIME FOR A BREAK

Ken Scherrieble
President

Safety Moment

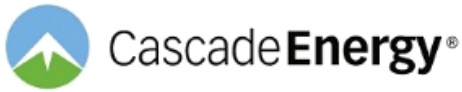
CAMDEN Group

- Contract Operations Firm
- Operating approximately 30 Drinking Water and Water Resource Recovery Facilities in NY State
- Entered a Public Private Partnership with the City of Oswego in February of 2016
- Clients are always looking for ways to save operating cost and provide better asset management solutions.
- 3 largest costs in operating these facilities
  - People
  - Power
  - Chemicals

City of Oswego
West Side Water Resource Recovery Facility
STRATEGIC ENERGY MANAGEMENT
Process

City of Oswego Energy Team

William J. Barlow Jr., Mayor
Kenneth Scherrieble, President
Bhavin Bhayani, PhD. Energy Champion
Timothy Woodard, Energy Team
Kevin White, Energy Team
Elizabeth Schoolcraft, Energy Team



Power

- According to a 2008 NYSERDA study
  - Power generally accounts for 25% - 40% of a municipal Water Resource Recovery facility budget
  - For Drinking Water facilities it can be as much as 80% of the budget
  - Nationally, these facilities account for 35% of a municipalities energy budget
  - Drinking Water and Wastewater represents 2% of the Nations Electrical usage adding 45 million tons of greenhouse gasses annually. (US EPA, 2016)

Facility Overview

- Serves the westside of Oswego including the college.
- Activated Sludge utilizing Contact Stabilization
- Average Daily Flow: 3.57 MGD
- Design Daily Flow: 4.0 MGD
- Maximum Wet Weather Flow: 12.0 MGD

Reasons for joining the SEM program

- Understand the strengths and weaknesses of current management practices
- Identify capital and process improvements
- Learn about new and advanced technologies
- Increasing staff energy IQ

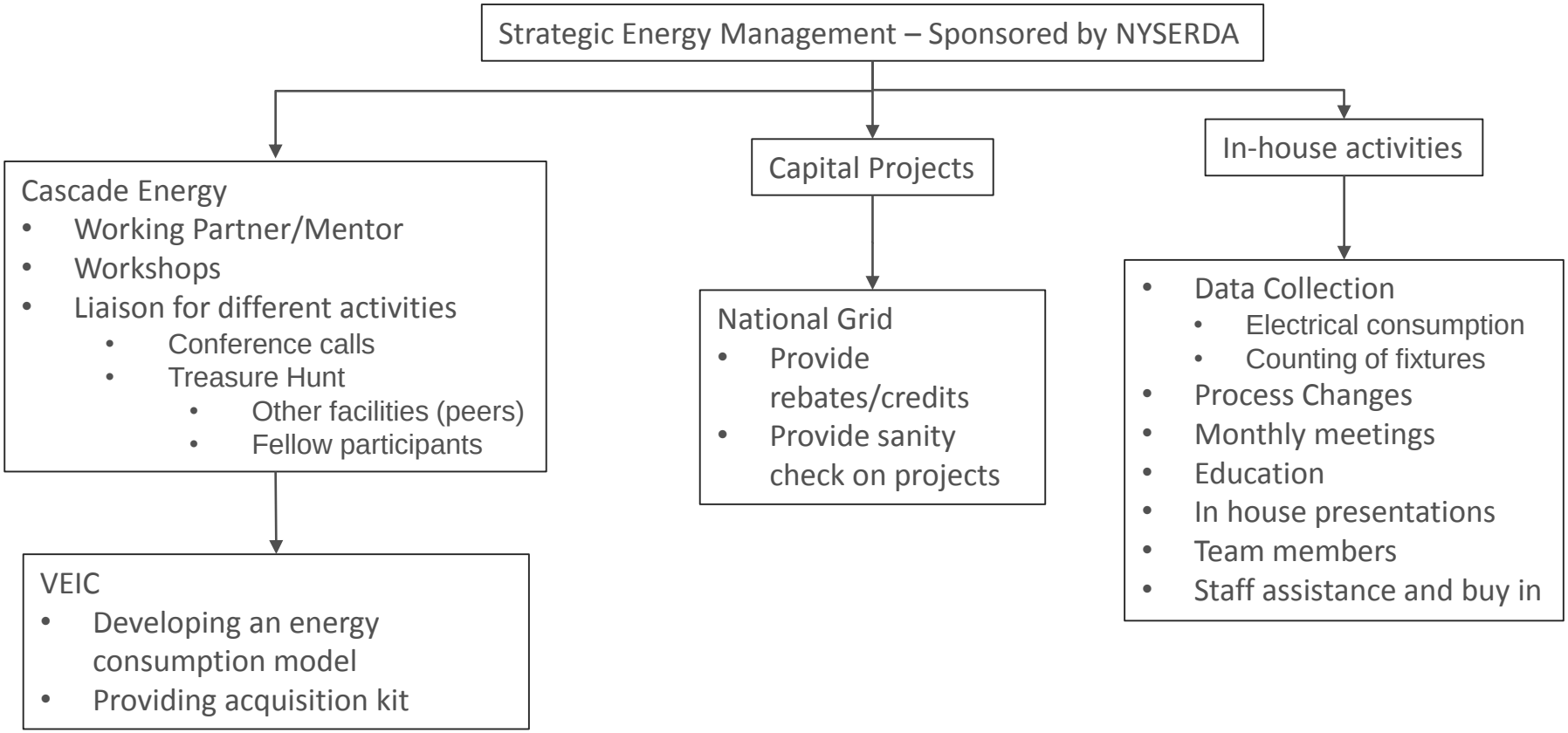
Electric as percentage of Budget

2018 Operating Budget	$1,462,437	
2018 Electric Costs	$ 102,305	
% of Operating Budget	7%	Well below the national average 25-40%
kWh per year	1,454,310	
$ per kWh	$0.07	per kWh. Including Demand Charges
Max kW	292.6	

Motivational Slide

Feeling pretty good about our 7%. Can we get even better?

Project Execution- Partnership



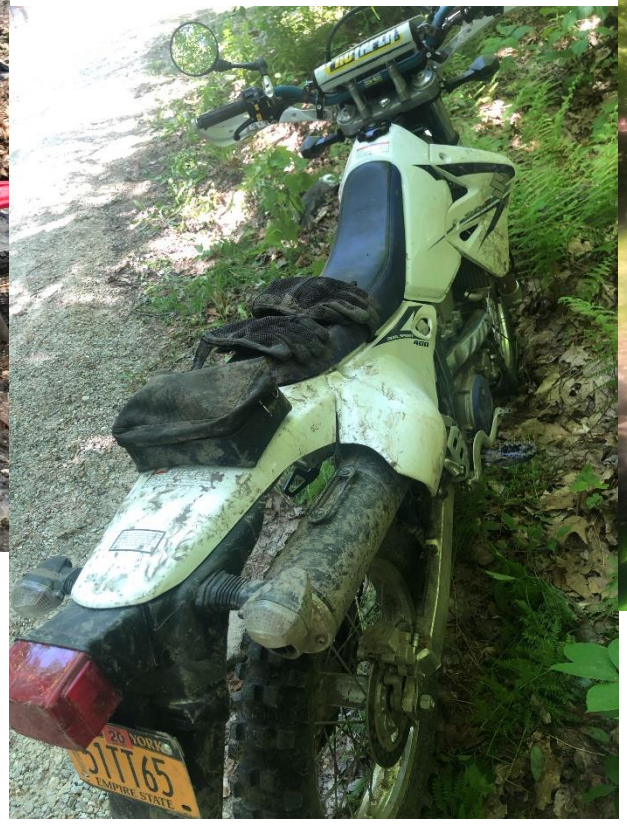
Coaching

- Cascade Energy
  - Provide mentorship in the areas of Employee engagement
  - 6 workshops and 2 webinars covering different areas
- VEIC
  - Provided use of the data acquisition devices and software
  - Energy modeling
  - Identify capital and process improvements
  - Learn about new and advanced technologies

The Process

- Description of the process/roadmap
  - (6) workshops
    - Program Overview (07/24/2018)
    - Saving Energy without Capital Improvements (08/22/2018)
    - Gaining Momentum (10/16/2018)
    - New Technology & Making SEM stick (12/04/2018)
    - Networking, Education, Incentives & Rewards, Communications (04/09/2019)
    - Final (10/16/2019)
  - (1) Treasure Hunt (09/24/2018)

What do you do when you get stuck!



Treasure Hunt

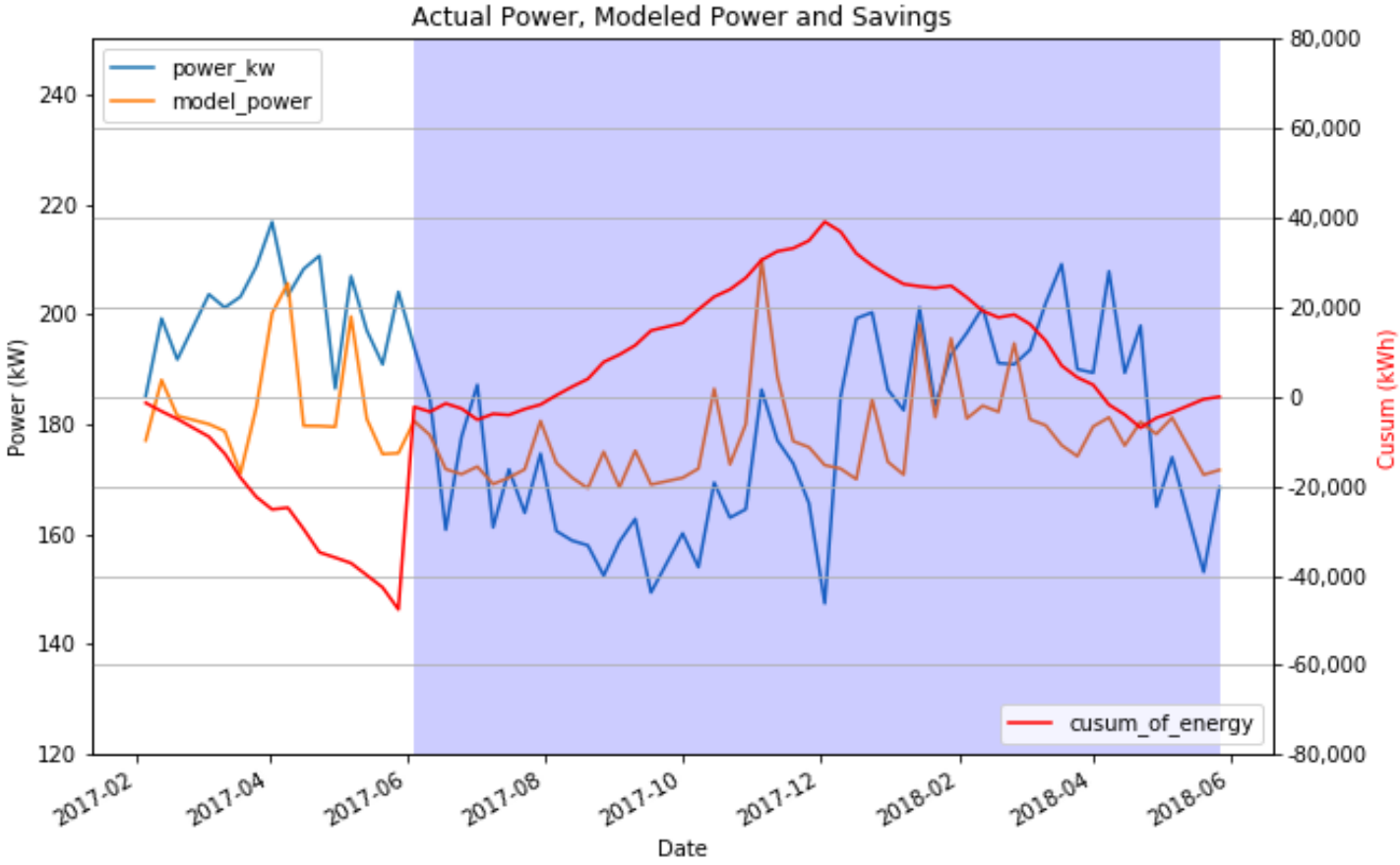
Treasure Hunt Takeaways

- Outside Lights on During the day
- Large Exhaust Blower for odor control on but not doing much
- Old electric water heaters for small volume of water
- Bad gas Pressure Reducing valve
- Should benchmark each blower (amp draw)
- Are solids optimized in the Aeration tanks
- Is solids removal being optimized
- LED lighting

Obstacles

- Employee Motivation
  - Small gems and quick wins while planning for long term strategic projects
  - Providing regular updates on project progress and potential savings
  - Employee recognition for their work
- Capital Projects
  - Finding the vendors that can supply certified products
  - Providing the correct head count of electrical fixtures (506)
  - Extensive paperwork to be completed for submission to National grid for credit/rebates

SEM Journey – Model and metrics



Baseline

Why is blower #2 most efficient?

Amps	Min	Max	Average	STDEV
Blower 1	71.35	93.99	84.46	0.11
Blower 2	73.69	81.75	75.91	0.19
Blower 3	79.87	93.32	83.55	0.16

SEM Journey – Lessons learned

- There are small but quick gems everywhere!
- Incremental changes can result in huge savings
- Future strategic capital projects should consider energy efficiency
- Quick wins are essential to gain and keep the momentum and commitment for bigger projects
- Take advantage of incentives from the utility!

SEM Journey – Year 1 actions taken

- Increased staff awareness and training
  - TURN OFF THE LIGHTS
  - Set timers or photo cells
  - Shut down odor control that is not doing anything!
- HVAC ($800,000 project going to bid this December)
- Blower measurement and optimization
  - D.O. Profiling
  - Improved control of Dissolved Oxygen in the Contact Tank
  - $1.2 Million SCADA and DO analysis project
- Improved solid waste management and process control improvements
  - Estimated savings of 61,300 kWh and $4,100 (4% Electrical savings)

Baseline 2018 January - October

Million Gallons Treated	923.6	MG
kW Used	1,252,691	kW
kw/MG	1,356.31	kW/MG
$/Kw	$0.07	
$/MG	$90.52	

January – October 2019

Million Gallons Treated	943.56	MG
kW Used	1,110,800	kW
kw/MG	1,177.24	kW/MG
$/kw	$0.07	
$/MG	$83.57	

Percent difference Tracking to end of July

OUR GOAL
5% REDUCTION IN ELECTRIC CONSUMPTION

To October	2018	2019	Difference	%
$/MG	$90.52	$83.57	$6.95	7.7%

3.57 MGD x 365 days = 1,303.05 MG x $6.95/MG = $9,056.20 or 7.7% in year 1

SEM Journey – Year 2 actions planned

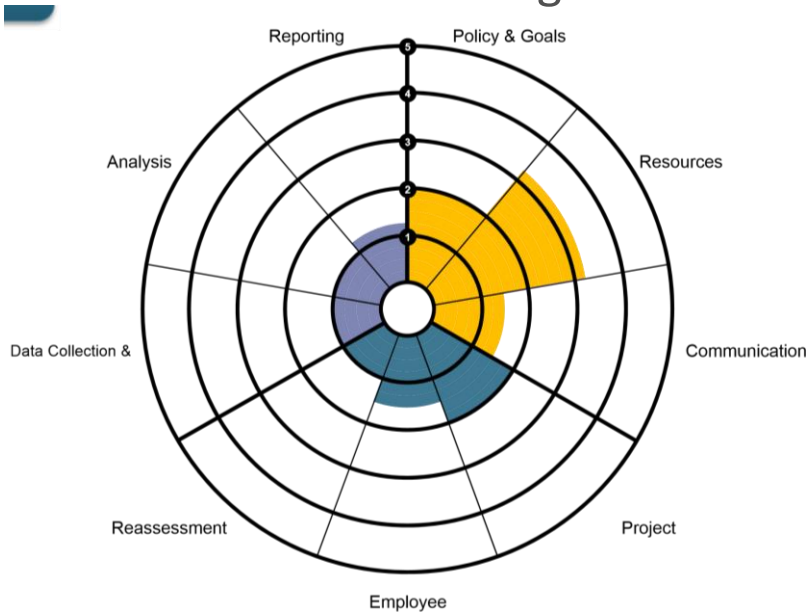
- Continue engaging and training staff
- Implement LED lighting project
- Implement full time DO monitoring of aeration blowers
- Invest in blowers capable of greater turndown
- Further optimize biomass handling

LED Lighting

- Replace 506 fixtures with LED lighting
- Cost of fixtures $10,595. In house labor
- Annual Savings $7,213
- Payback before rebates 1.5 years
- Savings is another 7% of our annual electric spend!
- $9,056.20 (process changes) + $7,213 (LED) = $16,269.20 ($102,305) 15.9% reduction over 2 years!

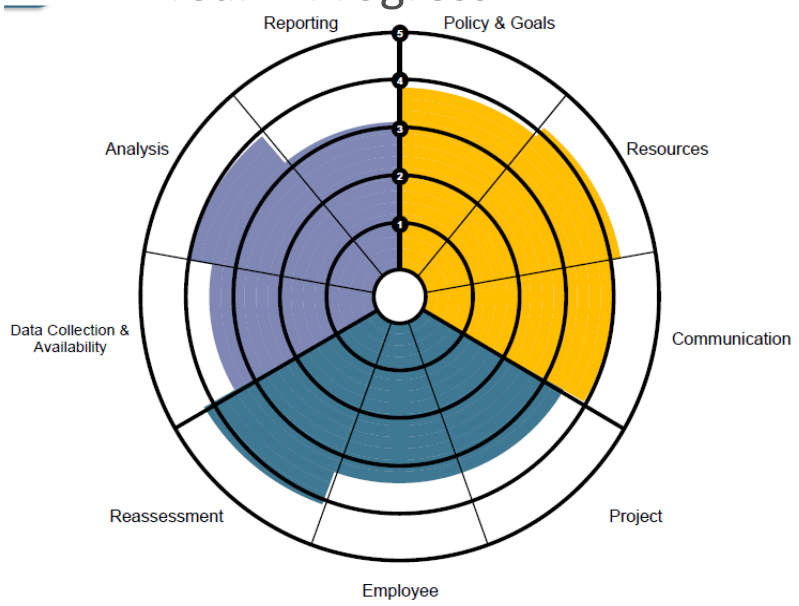
Progress Report- Energy Management Assessment

Start of the Program



Program Element	Primary Assessment Point	Score
COMMITMENT	Policy & Goals	2.00
	Resources	3.25
	Communication	1.50
PLANNING AND IMPLEMENTATION	Project Management	2.00
	Employee Engagement	1.50
	Reassessment	1.00
MEASURING AND REPORTING	Data Collection & Availability	1.00
	Analysis	1.00
	Reporting	1.25

Year 1 Progress



Program Element	Primary Assessment Point	Score
COMMITMENT	Policy & Goals	4.00
	Resources	4.25
	Communication	4.00
PLANNING AND IMPLEMENTATION	Project Management	3.50
	Employee Engagement	3.50
	Reassessment	4.25
MEASURING AND REPORTING	Data Collection & Availability	3.5
	Analysis	4.00
	Reporting	3.25

Technology keeps getting more efficient

Blowers
Motors
HVAC
Lights
VFD's
All electric devices are getting more efficient every day

Your SEM should

- Optimize what you currently have
- Operate as efficiently as possible (top of mind for staff)
- When replacing see if you can upgrade (get the latest tech)
- Make Energy Efficiency a part of all future capital projects

Technology Marches on

Conclusion

- Create an SEM team (internal and external)
- Keep your team informed of their progress and reward progress
- Look for hidden gems and ways to cut electricity without purchasing new equipment
- Look at configuration of piping, air lines etc.
  - Reduce Friction losses! Friction loss means increased electricity
- When replacing equipment what is long term payback of energy efficient equipment (IF ITS MORE THAN 10 YEARS OLD, THERE IS PROBABLY A MORE EFFICIENT VERSION ON THE MARKET)
- Make sure project team, including engineers are on board with energy efficiency when designing long term capital plans.
- Set an efficiency goal annually and strive to meet or beat it

THANK YOU

City of Oswego
Water Resource Recovery Facility
STRATEGIC ENERGY MANAGEMENT
Process

Ken Scherrieble


Time for
lunch

Advanced Manufacturing Office

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

50001 Ready Update

November 14, 2019

Pete Langlois
ISO 50001 Programs Manager

pete.langlois@ee.doe.gov

DOE's Spectrum Approach to ISO 50001 Adoption

DOE has developed an energy management continuum that begins with market-driven business culture and culminates in verified savings.

50001 Ready:
Recognition for ISO 50001 conformance using guidance in DOE's 50001 Ready Navigator tool

ISO 50001 Certification

Superior Energy Performance 50001™ (SEP 50001™):
Recognition for ISO 50001 certification and 3rd party verification of energy performance improvements

50001 Ready
U.S. DEPARTMENT OF ENERGY

- Self attested
- Top down energy data results
- No cost and no audit required
- DOE recognition, not certification, for established 50001 EnMS in place

Superior Energy Performance 50001™
U.S. DEPARTMENT OF ENERGY

- ISO 50001 certification required
- Top down and bottom up energy calculations
- Audit required at cost
- Provides 3rd party verification of savings from 50001

Guidance / Training / Management Tools / Data Analysis / Business Case / Success Stories / Recognition / Promotion

50001 Ready – DOE Recognition for Conforming to ISO 50001

1. Implement ISO 50001 principles

Complete 25 Tasks in US DOE's 50001 Ready Navigator free, self-guided online tool

2. Present energy performance

Submit energy performance data. May use EPA's Portfolio Manager or DOE's EnPI Lite

3. Self-attest to 50001 Ready

Sign-off by management of 50001 Ready implementation and commitment

DOE recognizes 50001 Ready achievement

50001 Ready Program History

- Why: Expand ISO 50001 adoption efforts to overcome common barriers
  - Cost of certification
  - Lack of market demand and reputation benefits
  - Confusion on how to begin and proceed
- What: Create a “dynamic” e-Guide to allow teams to understand and manage the process, and be rewarded when they put the EnMS in place

- 2016-17: 50001 Ready program and software development
- May 2017: Navigator software and program go live online
- June 2017: First facility recognized (Four Seasons Produce)
- April/May 2018: In-plant training workshops, utility network calls begin
- May 2018: Environmental Leader Product of the Year award
- August 2018: ISO 50001 standard is revised

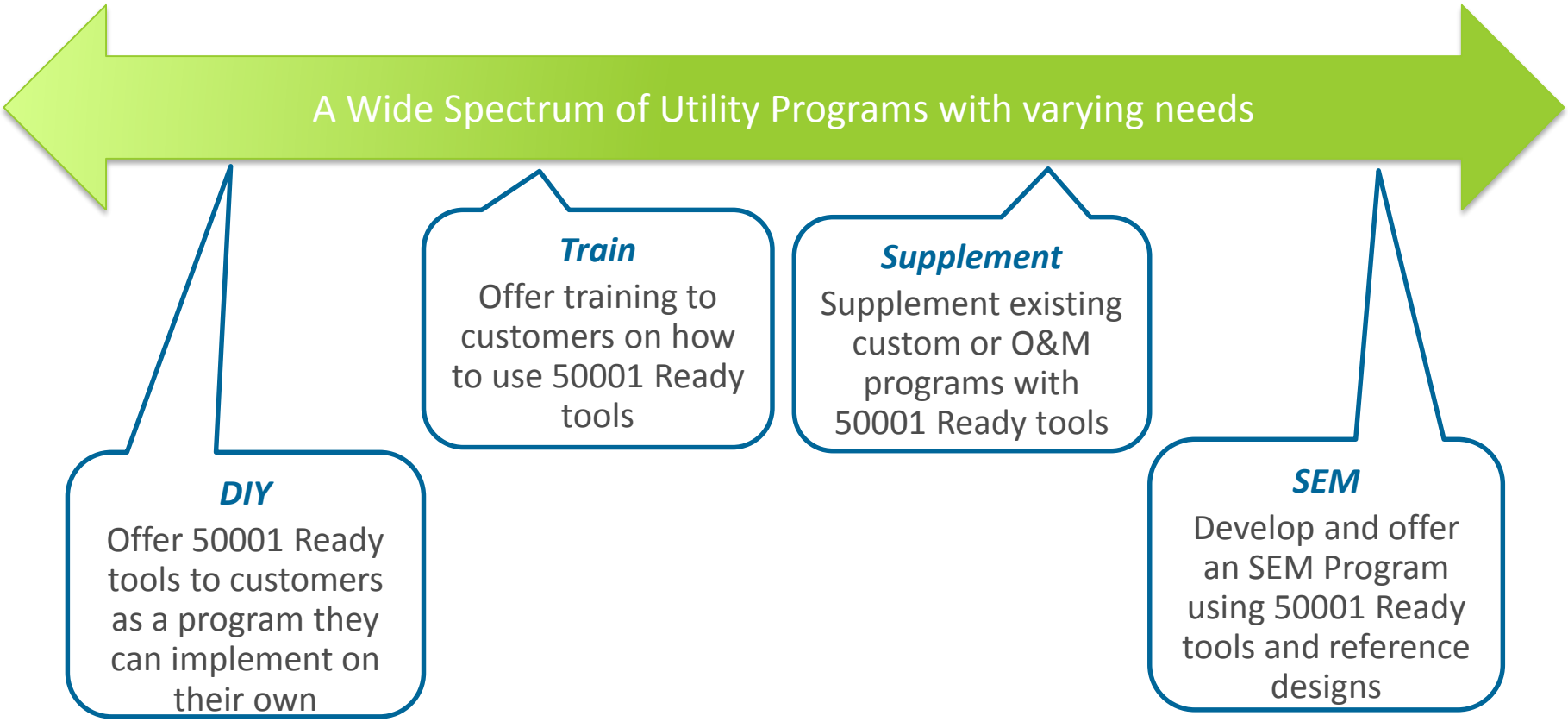
50001 Ready Program History *(continued)*

- September 2018: 1000th Navigator user account created
- November 2018: Multi-site functionality added (Navigator 2.0)
- May 2019: **Partner platform functionality added**
- 2018-19: LOIs and MOUs with Saudi Arabia, Canada, and Mexico
- *December 2019*: Navigator 3.0

- Currently:
  - 52 recognized facilities / 994 system implementation projects / 2,053 users
  - Utilities and partners engaged with the partner platform:

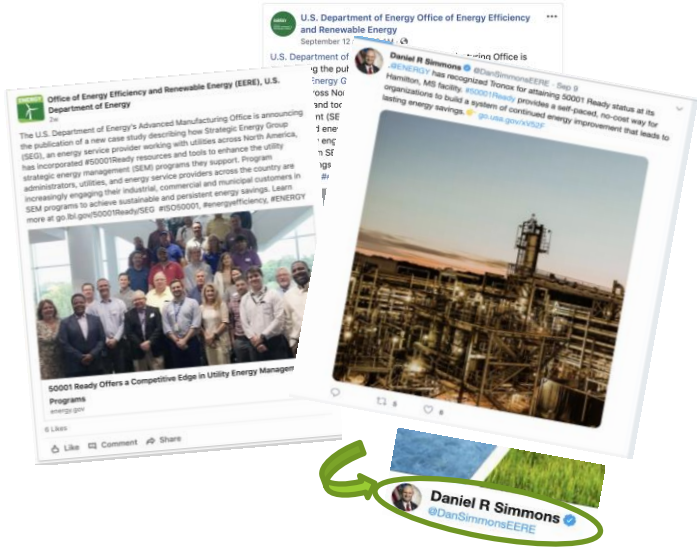
50001 Ready Program for Utilities and Implementers

- The 50001 Ready program is designed to be used by program administrators and implementers in whatever way fits their goals



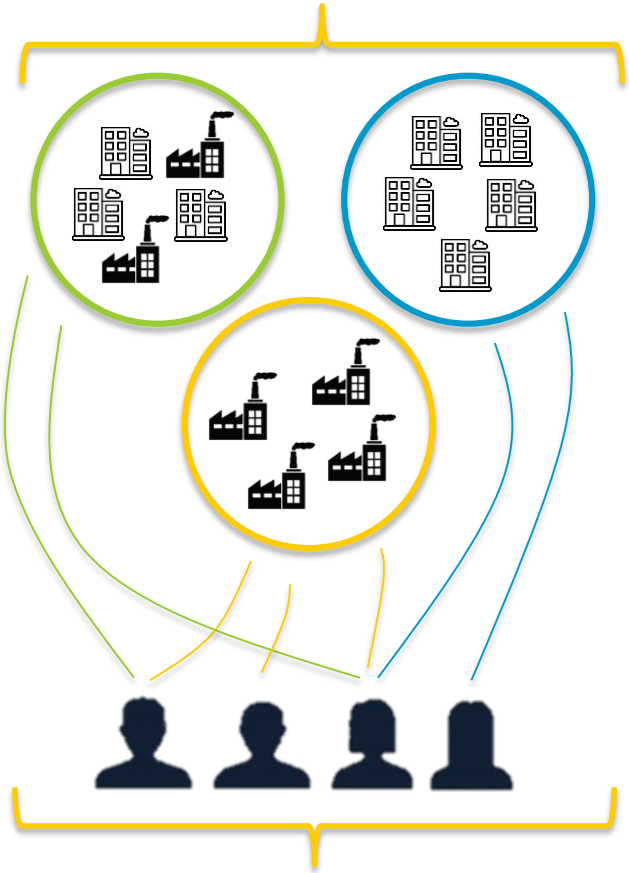
Utilities and Implementers: Increase SEM Participation

- When facilities self attest to the completion of 50001 Ready, DOE helps to promote the success of the facility, implementer, and utility through project showcases and implementer case studies



What Can You Do With the Partner Platform?

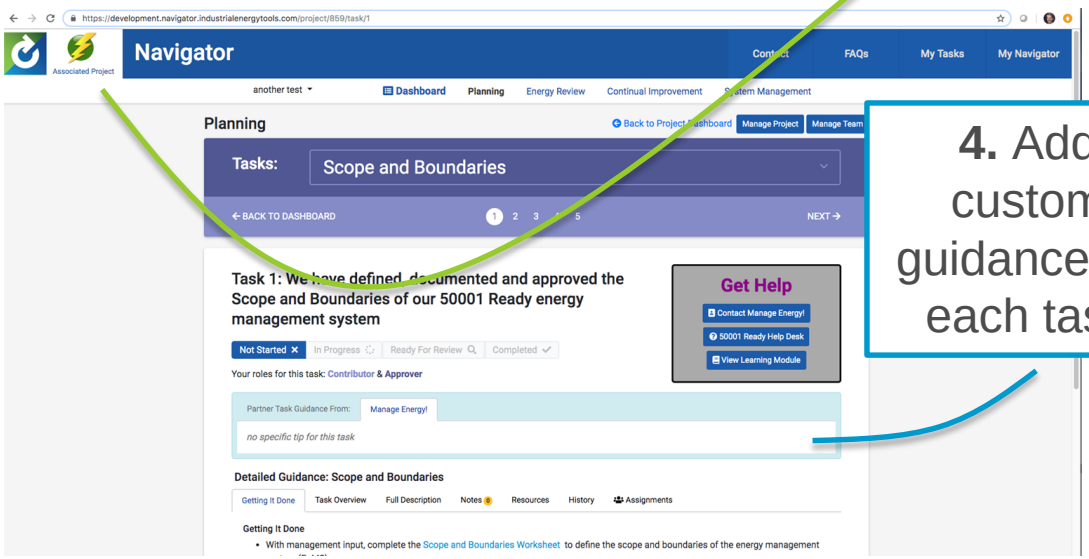
1. Organize multiple facilities into cohorts.



Allow individuals from any organization access to track progress and provide custom guidance.

2. Use 50001 Ready logo on your website and materials

3. Your logo on Navigator and recognition certificate



4. Add custom guidance for each task

SEM Partner: Leidos

Operates SEM programs for Wisconsin Focus on Energy, PG&E, Ameren Illinois, and Detroit Edison

- **Wisconsin:** Between 2015 and 2018, 31 facilities participated in Leidos-administered SEM program. Nearly half pursued ISO 50001 certification or 50001 Ready recognition.
  - Certified coaches
  - Peer Network

"Our bottom line is that we need to produce energy savings for the program, and SEM with 50001 Ready is a great way to get at those savings without costly capital improvements. This energy management approach delivers great benefits to our customers – particularly those that have already captured the easiest energy savings."

– Tim Dantoin, Engineering Manager, Leidos

Focus on Energy, Wisconsin's utility-funded efficiency program, introduced 50001 Ready to this Neenah specialty paper facility

SEM Partner: Strategic Energy Group (SEG)

Works with many utilities across North America including TVA, PG&E, PPL Electric Utilities, and Idaho Power

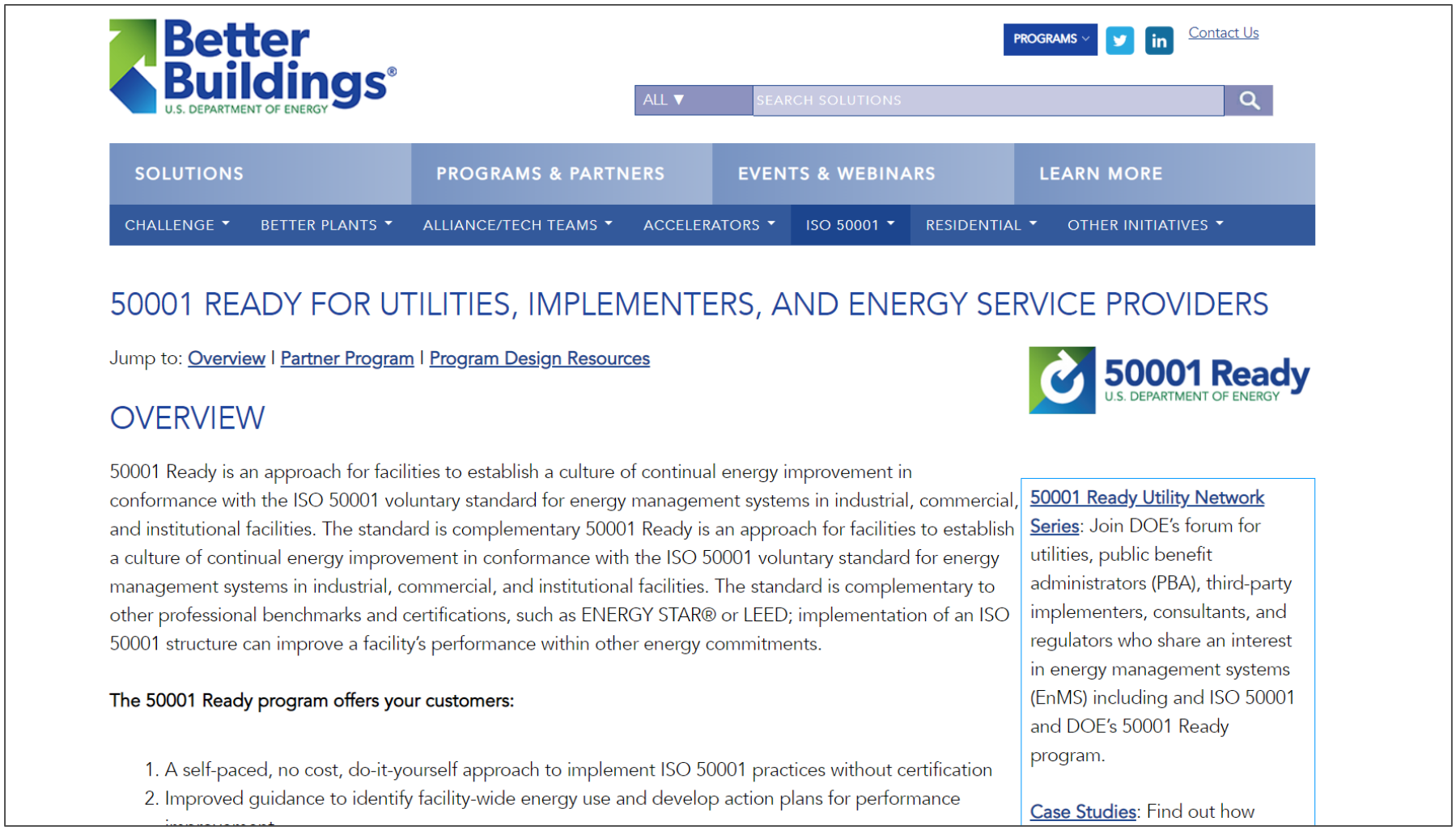
- **TVA Energy Right Solutions program:** SEG integrated 50001 Ready and the Navigator tool midway through its initial two-year SEM offering, earlier on in second cohort
- **Idaho:** Guided several school districts served by Idaho Power to 50001 Ready recognition

Polaris and SEG TVA cohort teams

"It's all about organizational change and 50001 Ready provides a pathway and annual gap analysis for an energy management process. With a structured approach like SEM and 50001 Ready, we have experienced a savings range of five to twenty-two percent net of capital."

– Ed Birch, Principal, Strategic Energy Group

Additional Resources



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50001 READY FOR UTILITIES, IMPLEMENTERS, AND ENERGY SERVICE PROVIDERS

Jump to: Overview | Partner Program | Program Design Resources

50001 Ready
U.S. DEPARTMENT OF ENERGY

OVERVIEW

50001 Ready is an approach for facilities to establish a culture of continual energy improvement in conformance with the ISO 50001 voluntary standard for energy management systems in industrial, commercial, and institutional facilities. The standard is complementary 50001 Ready is an approach for facilities to establish a culture of continual energy improvement in conformance with the ISO 50001 voluntary standard for energy management systems in industrial, commercial, and institutional facilities. The standard is complementary to other professional benchmarks and certifications, such as ENERGY STAR® or LEED; implementation of an ISO 50001 structure can improve a facility's performance within other energy commitments.

The 50001 Ready program offers your customers:

1. A self-paced, no cost, do-it-yourself approach to implement ISO 50001 practices without certification
2. Improved guidance to identify facility-wide energy use and develop action plans for performance

50001 Ready Utility Network Series: Join DOE's forum for utilities, public benefit administrators (PBA), third-party implementers, consultants, and regulators who share an interest in energy management systems (EnMS) including and ISO 50001 and DOE's 50001 Ready program.

Case Studies: Find out how

Visit the 50001 Ready website at energy.gov/50001Ready

- Download info sheets and FAQs
- Find links to the Navigator and EnPI Lite
- See 50001 Ready recognized facilities
- Read case studies and additional resources
- Read more about ISO 50001 and related programs

Pete Langlois

Advanced Manufacturing Office
US Department of Energy
pete.langlois@ee.doe.gov
202-586-0984

Navigator 3.0 – Updated for ISO 50001:2018 Revision

Updates clarify expectations for organizations committed to ISO 50001

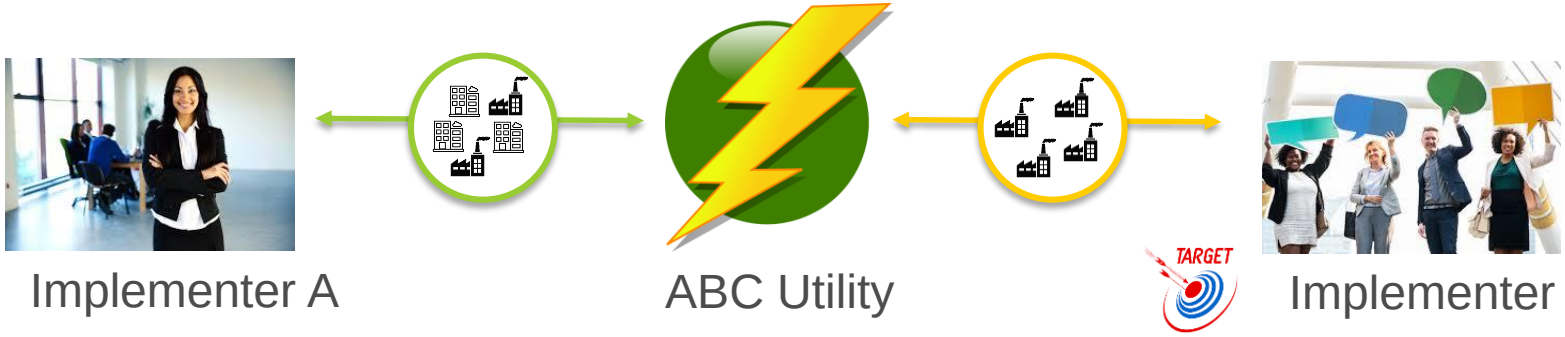
- **Top management**: expanded role and description of responsibilities
- **Continual energy performance improvement**: strengthened demonstration and emphasis on measurable benefits
- **Types of energy** within the scope and boundaries cannot be excluded
- **Topics with new clarifying details**:
  - Energy review, energy performance indicators and associated energy baselines
  - Energy data collection plan (previously the energy management plan)
  - Normalization for variables that affect performance
- **Reorganized content and user friendliness**
  - Adopts ISO's new "high-level structure" that aligns all management system standards for consistency and greater cross-discipline integration

ISO 50001:2011 to 2018 Transition Guide Created by the DOE, LBNL, and the US TAG to navigate this revision including:

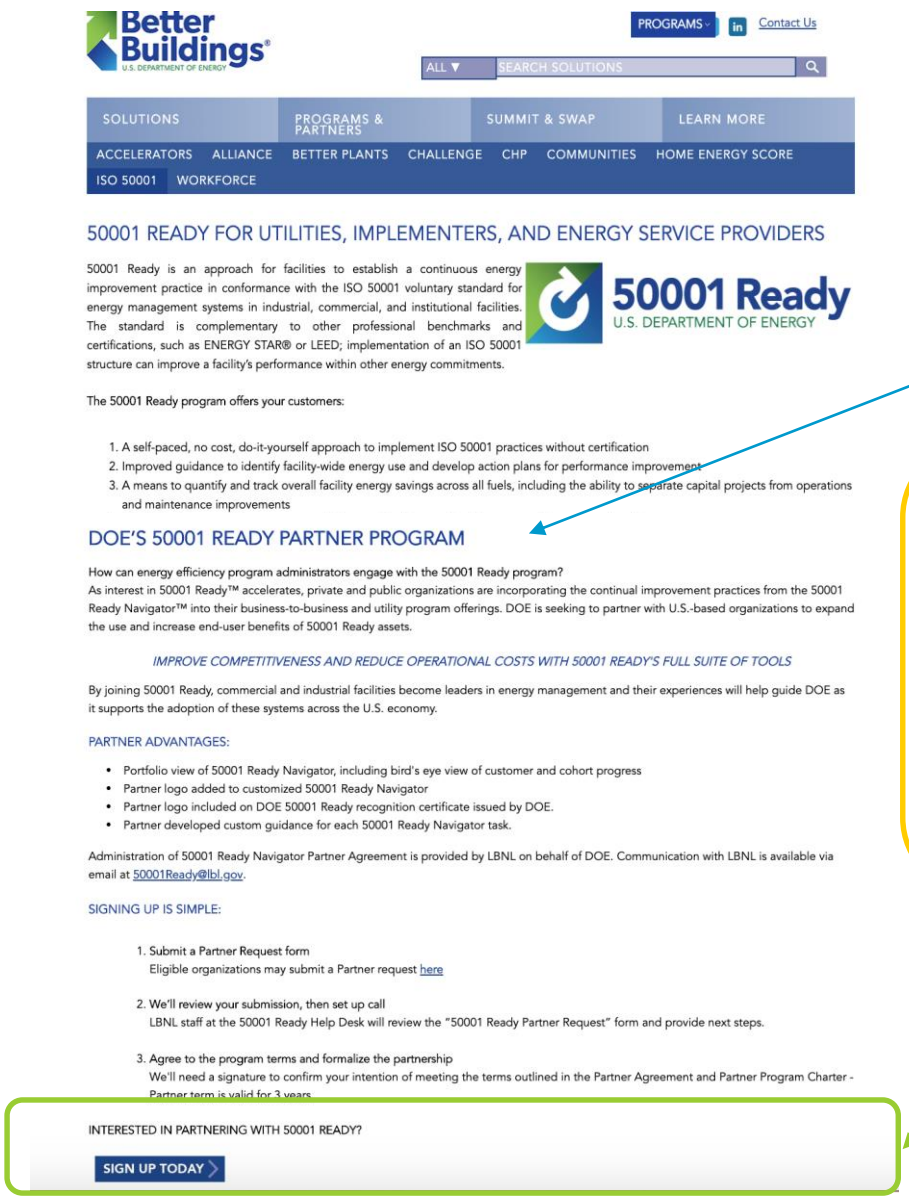
- ✓ Section by section comparison of changes
- ✓ Addition of High Level Structure (HLS) as found in other popular ISO standards (14001 / 9001)

Utility/Implementer Relationship: Who Should Be a Partner?

- Pop Quiz!
  - ABC Utility has an SEM program and wants to use Ready!
  - ABC Utility has two SEM cohorts, one run by Implementer A and the other by Implementer B
  - Implementer A is already a 50001 Ready Partner with DOE
  - Implementer B isn't a 50001 Ready Partner
- Questions:
  - Should ABC Utility be the Partner?
  - Does Implementer A have to give up their Partnership to work under ABC Utility's Partnership?
  - Why isn't Implementer B a Partner already?
- Answer: The Partner Platform allows for all to be Partners and custom manage cohorts and co-branding so any utility/implementer(s) relationship works!



Partner Program – DOE Website



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ACCELERATORS ALLIANCE BETTER PLANTS CHALLENGE CHP COMMUNITIES HOME ENERGY SCORE ISO 50001 WORKFORCE

50001 READY FOR UTILITIES, IMPLEMENTERS, AND ENERGY SERVICE PROVIDERS

50001 Ready is an approach for facilities to establish a continuous energy improvement practice in conformance with the ISO 50001 voluntary standard for energy management systems in industrial, commercial, and institutional facilities. The standard is complementary to other professional benchmarks and certifications, such as ENERGY STAR® or LEED; implementation of an ISO 50001 structure can improve a facility's performance within other energy commitments.

50001 Ready
U.S. DEPARTMENT OF ENERGY

The 50001 Ready program offers your customers:

1. A self-paced, no cost, do-it-yourself approach to implement ISO 50001 practices without certification
2. Improved guidance to identify facility-wide energy use and develop action plans for performance improvement
3. A means to quantify and track overall facility energy savings across all fuels, including the ability to separate capital projects from operations and maintenance improvements

DOE'S 50001 READY PARTNER PROGRAM

How can energy efficiency program administrators engage with the 50001 Ready program?
As interest in 50001 Ready™ accelerates, private and public organizations are incorporating the continual improvement practices from the 50001 Ready Navigator™ into their business-to-business and utility program offerings. DOE is seeking to partner with U.S.-based organizations to expand the use and increase end-user benefits of 50001 Ready assets.

IMPROVE COMPETITIVENESS AND REDUCE OPERATIONAL COSTS WITH 50001 READY'S FULL SUITE OF TOOLS

By joining 50001 Ready, commercial and industrial facilities become leaders in energy management and their experiences will help guide DOE as it supports the adoption of these systems across the U.S. economy.

PARTNER ADVANTAGES:

- Portfolio view of 50001 Ready Navigator, including bird's eye view of customer and cohort progress
- Partner logo added to customized 50001 Ready Navigator
- Partner logo included on DOE 50001 Ready recognition certificate issued by DOE.
- Partner developed custom guidance for each 50001 Ready Navigator task.

Administration of 50001 Ready Navigator Partner Agreement is provided by LBNL on behalf of DOE. Communication with LBNL is available via email at 50001Ready@lbl.gov.

SIGNING UP IS SIMPLE:

1. Submit a Partner Request form
   Eligible organizations may submit a Partner request here
2. We'll review your submission, then set up call
   LBNL staff at the 50001 Ready Help Desk will review the "50001 Ready Partner Request" form and provide next steps.
3. Agree to the program terms and formalize the partnership
   We'll need a signature to confirm your intention of meeting the terms outlined in the Partner Agreement and Partner Program Charter - Partner term is valid for 3 years

INTERESTED IN PARTNERING WITH 50001 READY?

SIGN UP TODAY

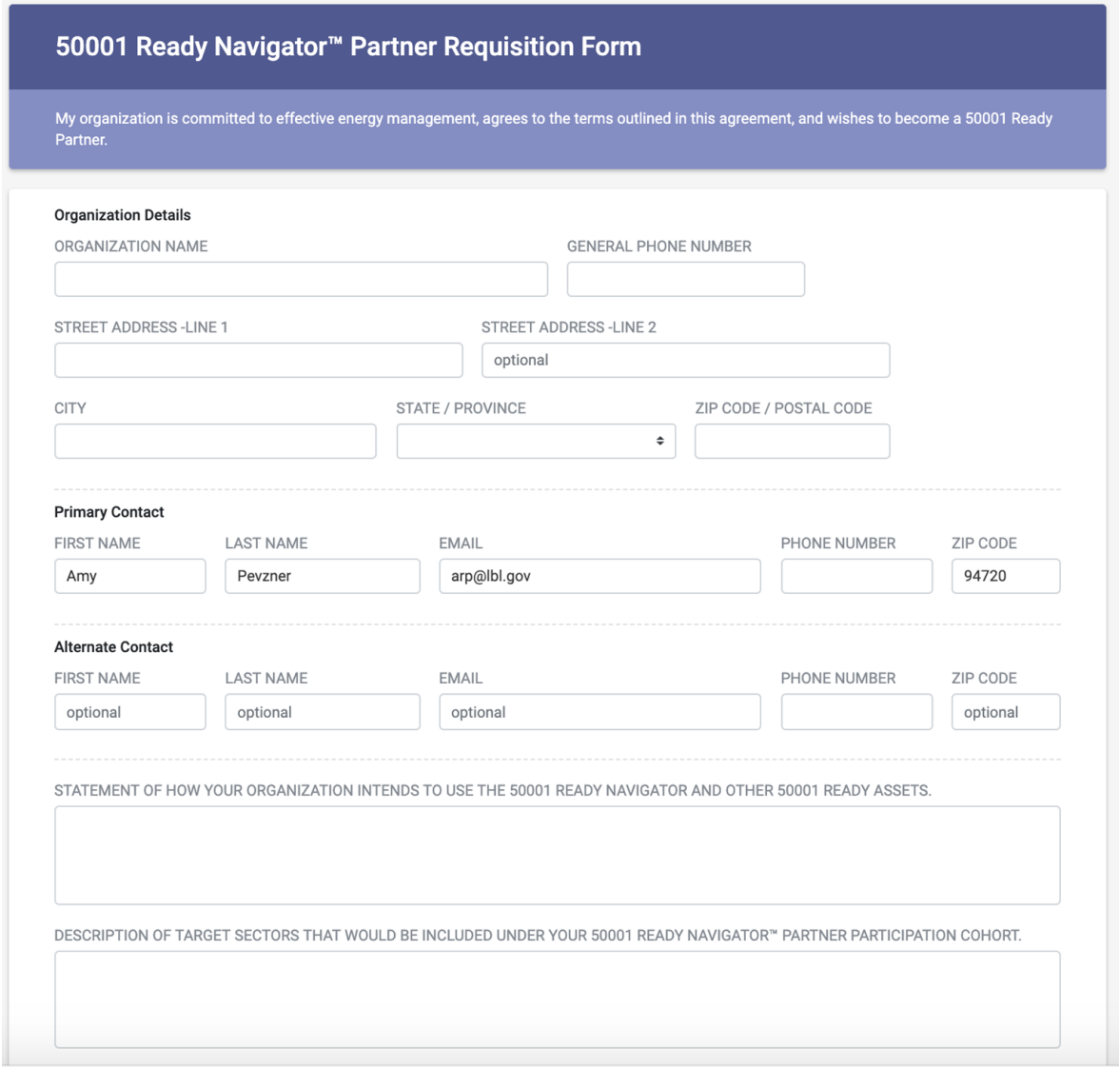
The Partner Program features an open and flexible system to work with your business structure and current set of offerings to support your customers with 50001 Ready and EnMS implementation.

To learn more about the 50001 Ready Partner Program, visit the **Better Buildings Solutions** website at:
Energy.gov/50001Ready
"50001 Ready for Program Administrators & Implementers"
"DOE'S 50001 Ready Partner Program" section at top of page

https://betterbuildingssolutioncenter.energy.gov/iso-50001/50001Ready/50001-ready-program-utilities-admin-implementers

To sign up, click the link to fill out a **Partner Requisition** form

Signing Up - Partner Requisition Form



50001 Ready Navigator™ Partner Requisition Form

My organization is committed to effective energy management, agrees to the terms outlined in this agreement, and wishes to become a 50001 Ready Partner.

Organization Details

ORGANIZATION NAME | GENERAL PHONE NUMBER

STREET ADDRESS -LINE 1 | STREET ADDRESS -LINE 2 (optional)

CITY | STATE / PROVINCE | ZIP CODE / POSTAL CODE

Primary Contact

FIRST NAME	LAST NAME	EMAIL	PHONE NUMBER	ZIP CODE
Amy	Pevzner	arp@lbl.gov		94720

Alternate Contact

FIRST NAME	LAST NAME	EMAIL	PHONE NUMBER	ZIP CODE
optional	optional	optional		optional

STATEMENT OF HOW YOUR ORGANIZATION INTENDS TO USE THE 50001 READY NAVIGATOR AND OTHER 50001 READY ASSETS.

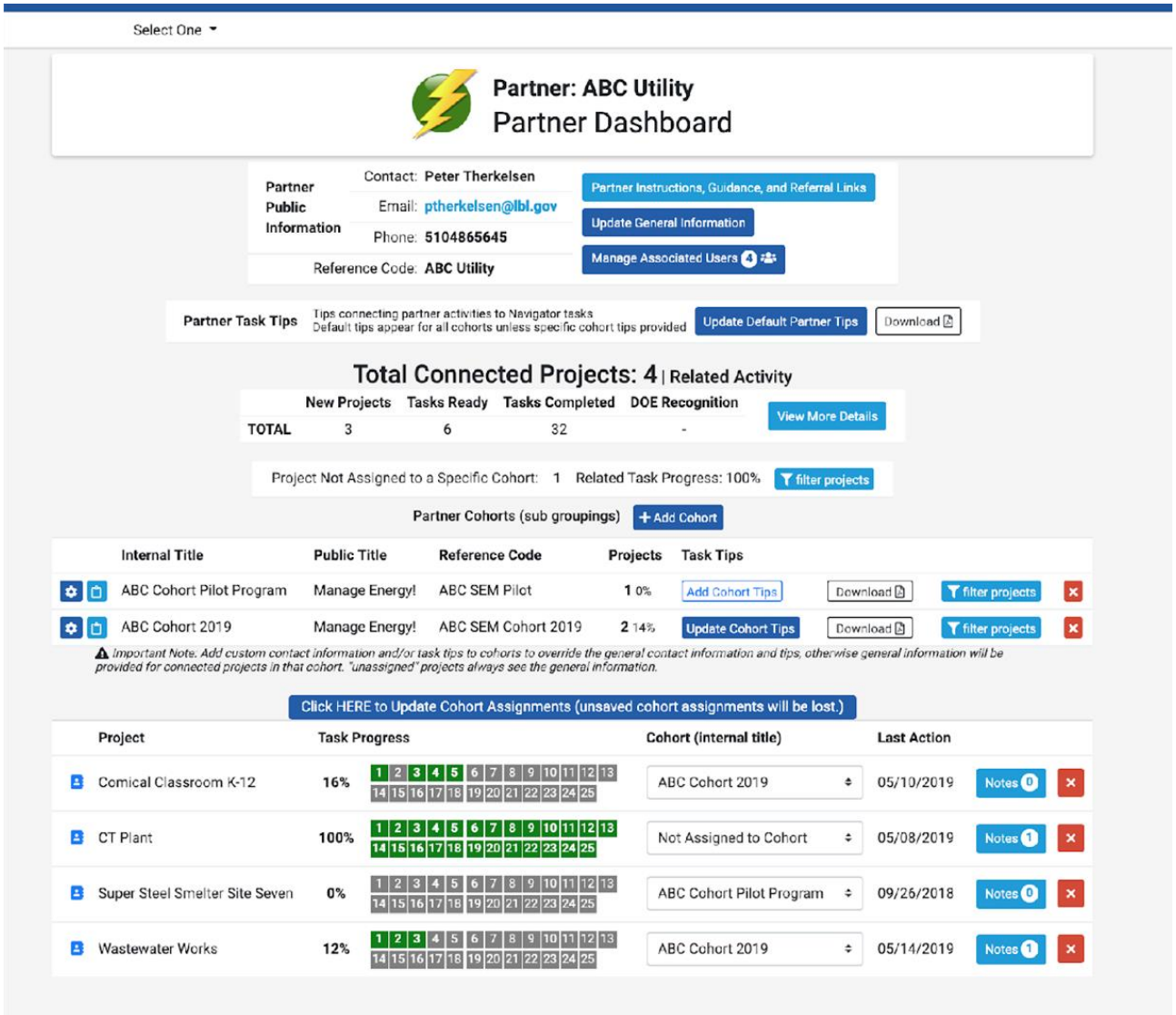
DESCRIPTION OF TARGET SECTORS THAT WOULD BE INCLUDED UNDER YOUR 50001 READY NAVIGATOR™ PARTNER PARTICIPATION COHORT.

Link found on the Better Building Solution site or https://navigator.lbl.gov/partnerEnrollmentForm

*You'll want to set up an account in the Navigator first.

Just complete this form and the 50001 Ready Help Desk will contact you with next steps!

Partner Dashboard



Banner indicates your location within the tool

Add or Update **General Tips**

Add or Update **Cohort Tips**

Track **projects, task progress, cohort assignments** and **notes**

Cascade Energy®

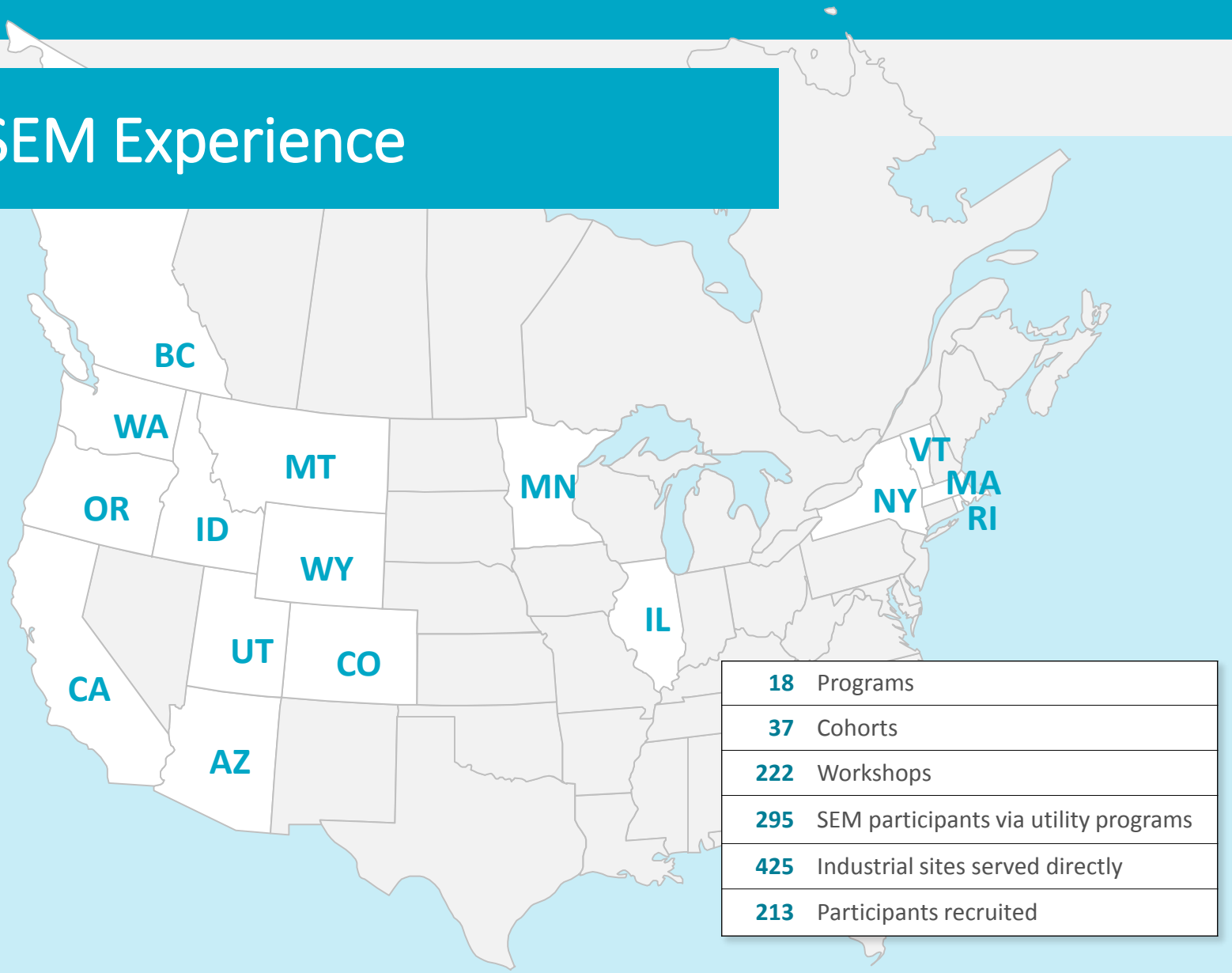
Northeast Strategic Energy Management Collaborative Workshop

Northeast Regional Highlights

Jeff Hare
SEM/Aquafficiency
Operations Manager

Let’s talk turkey

Our SEM Experience

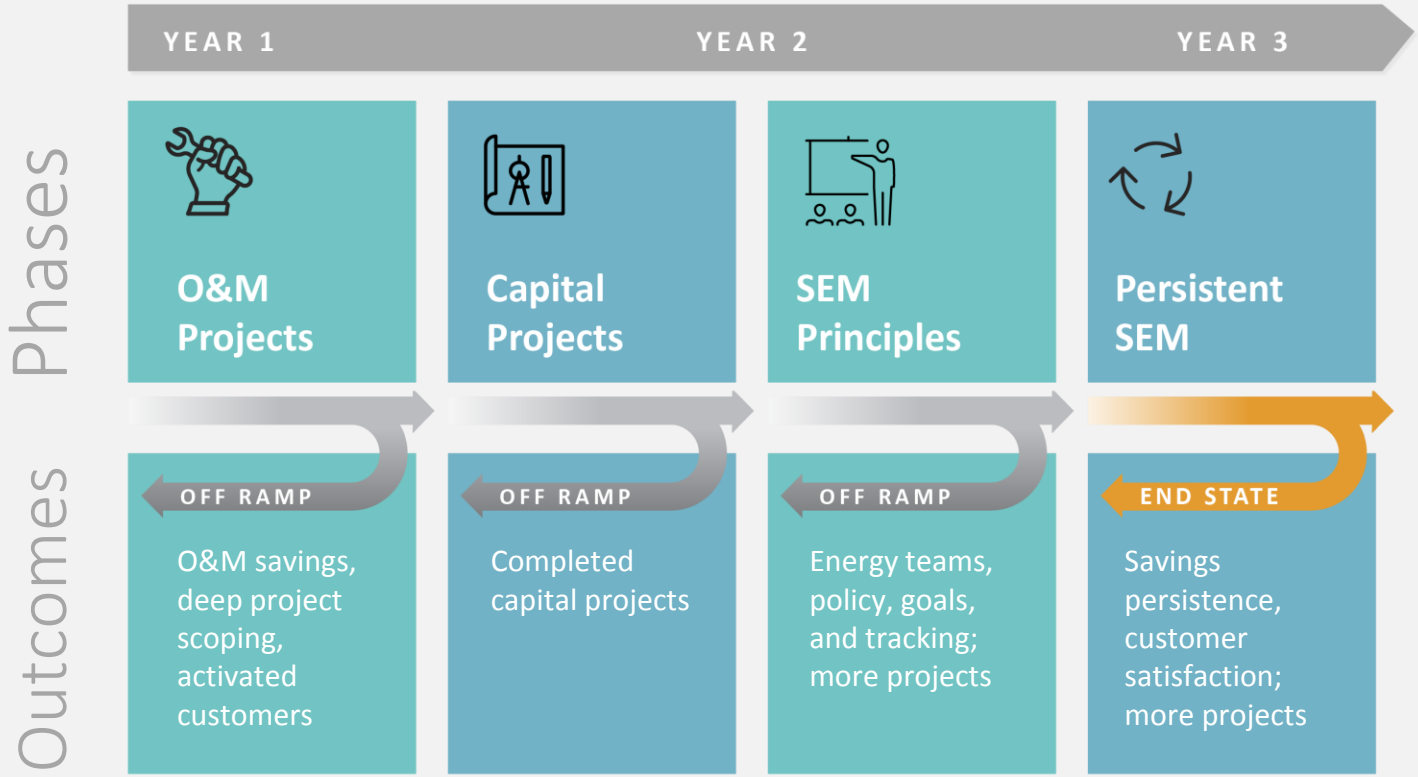


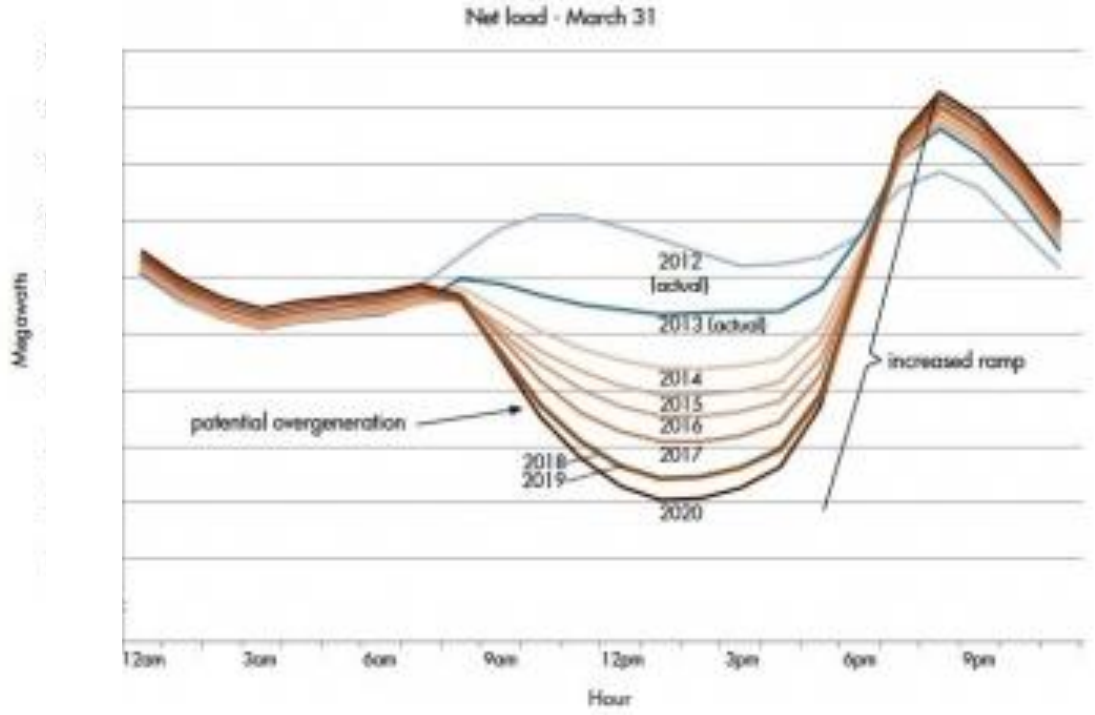
18	Programs
37	Cohorts
222	Workshops
295	SEM participants via utility programs
425	Industrial sites served directly
213	Participants recruited

What’s New?

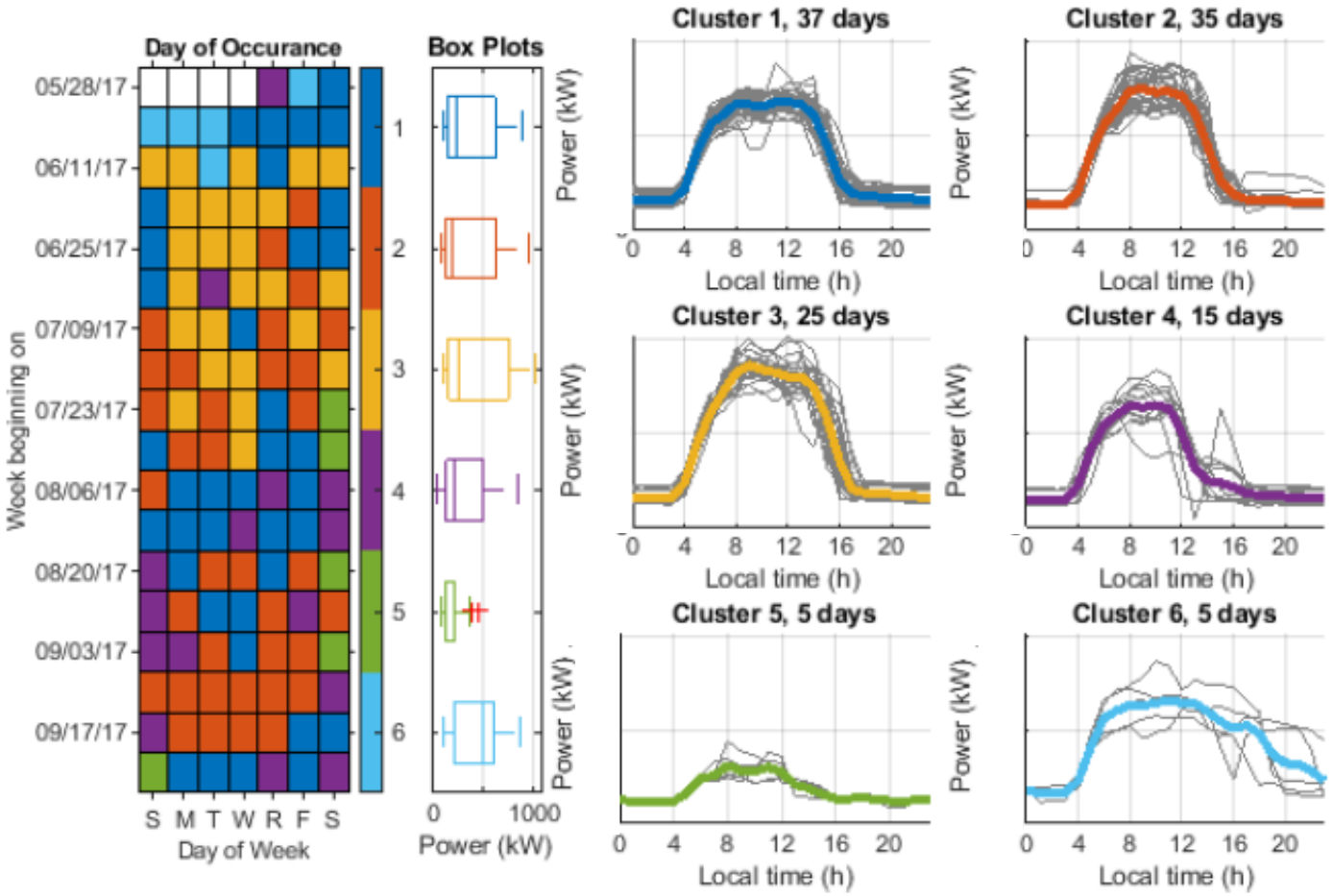
Natural Gas

Flex SEM


YEAR 1
YEAR 2
YEAR 3
Phases
Outcomes
O&M Projects
Capital Projects
SEM Principles
Persistent SEM
OFF RAMP
OFF RAMP
OFF RAMP
END STATE
O&M savings, deep project scoping, activated customers
Completed capital projects
Energy teams, policy, goals, and tracking; more projects
Savings persistence, customer satisfaction; more projects



California Independent System Operator


Day of Occurance
Box Plots
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06/25/17
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Power (kW)
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Cluster 3, 25 days
Cluster 4, 15 days
Cluster 5, 5 days
Cluster 6, 5 days
0 4 8 12 16 20
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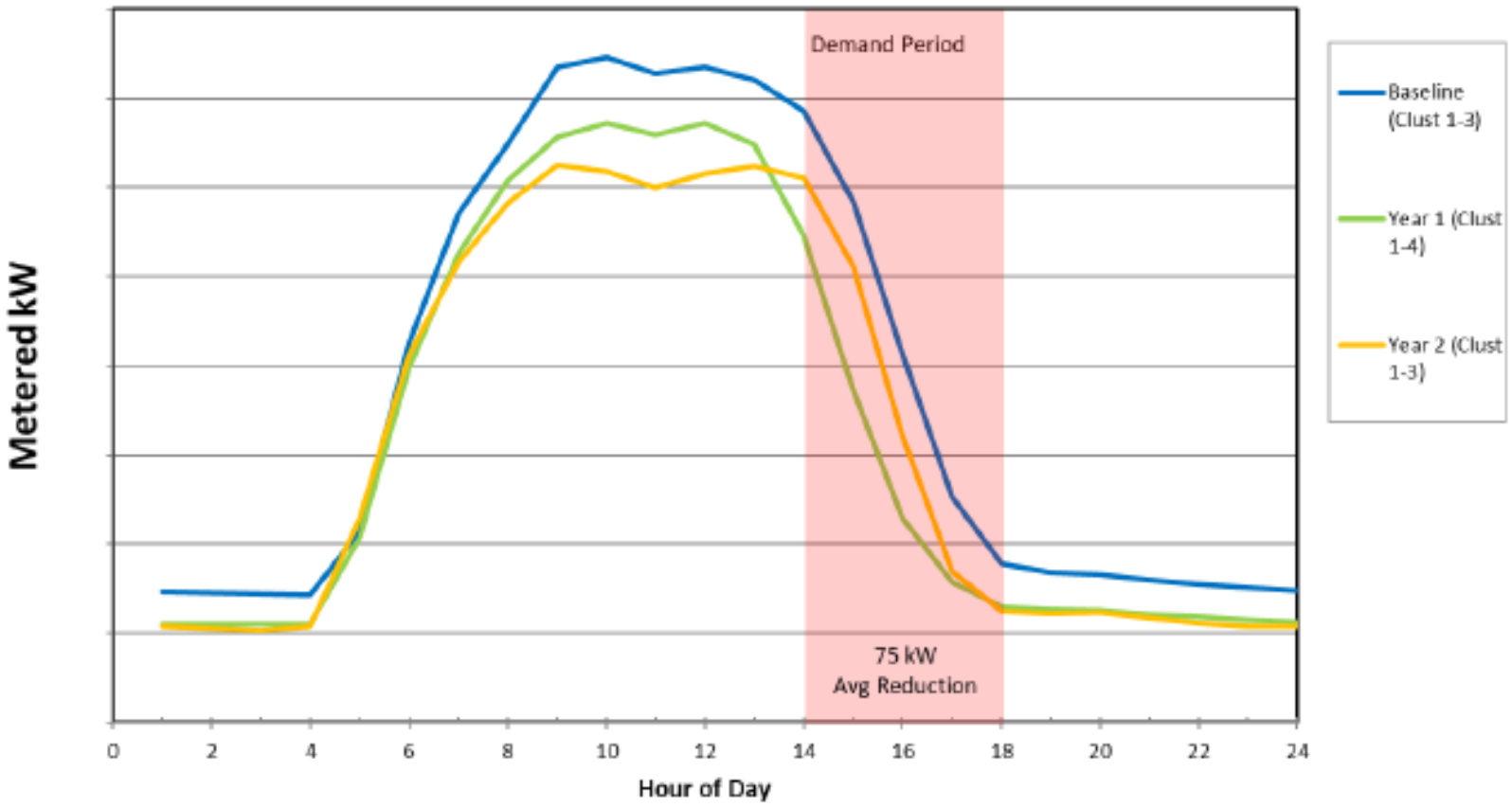
Demand Period
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Avg Reduction
Metered kW
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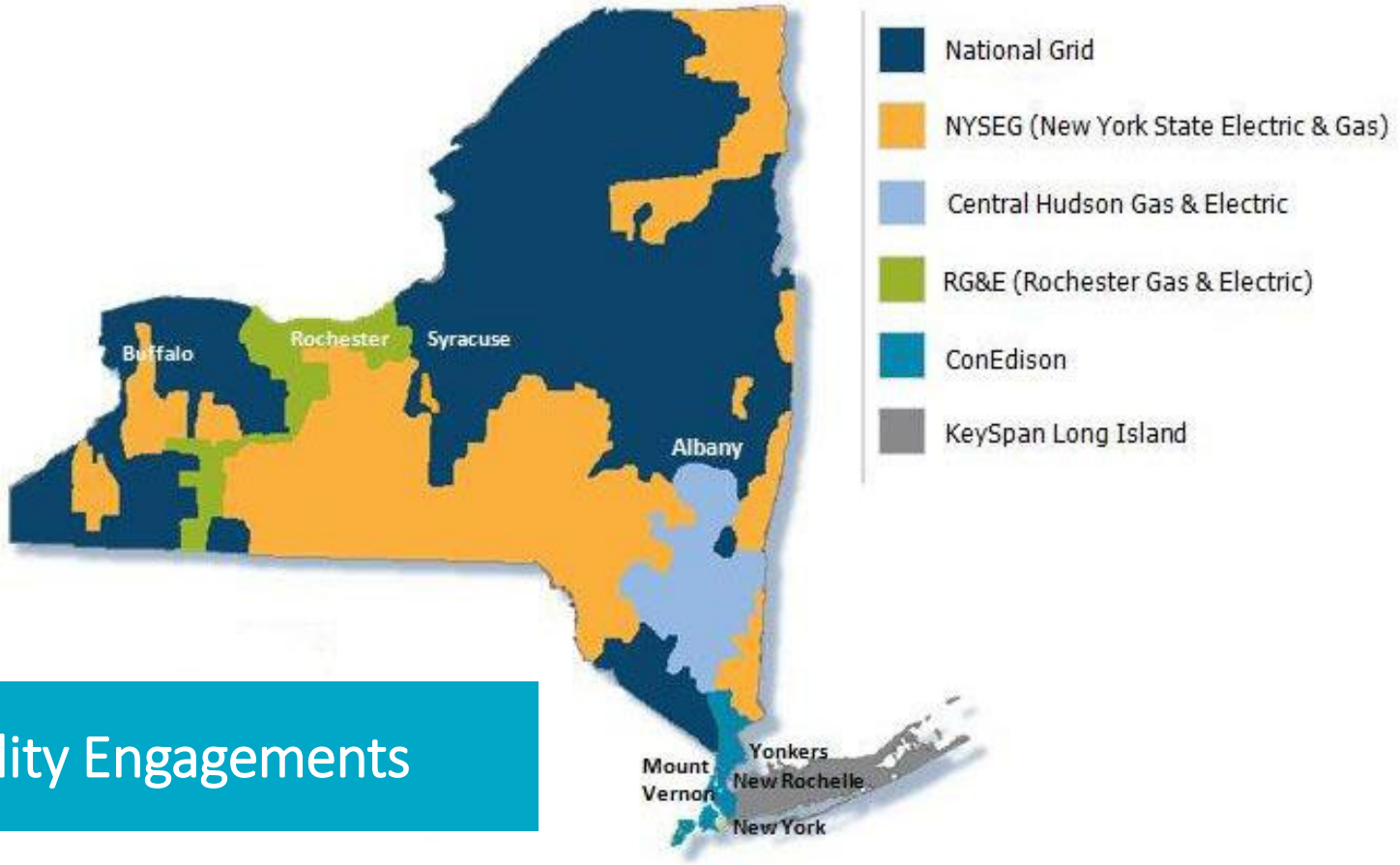
Year 1 (Clust 1-4)
Year 2 (Clust 1-3)

Multiple Utility Engagements




Forests
Butte
Billings
Bozeman
CROW
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Payette
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Beaverhead-Deerlodge
National Forest
Salmon -
Challis
National Forest
Yellowstone
National Park
Shoshone
National Forest
REGON
Boise
Nampa
IDAHO
Idaho Falls
Jackson
WIND RIVER
RESERVATION
WYOMING
Casper
Pocatello
Twin Falls
Ogden
Salt Lake City
Sandy
Provo
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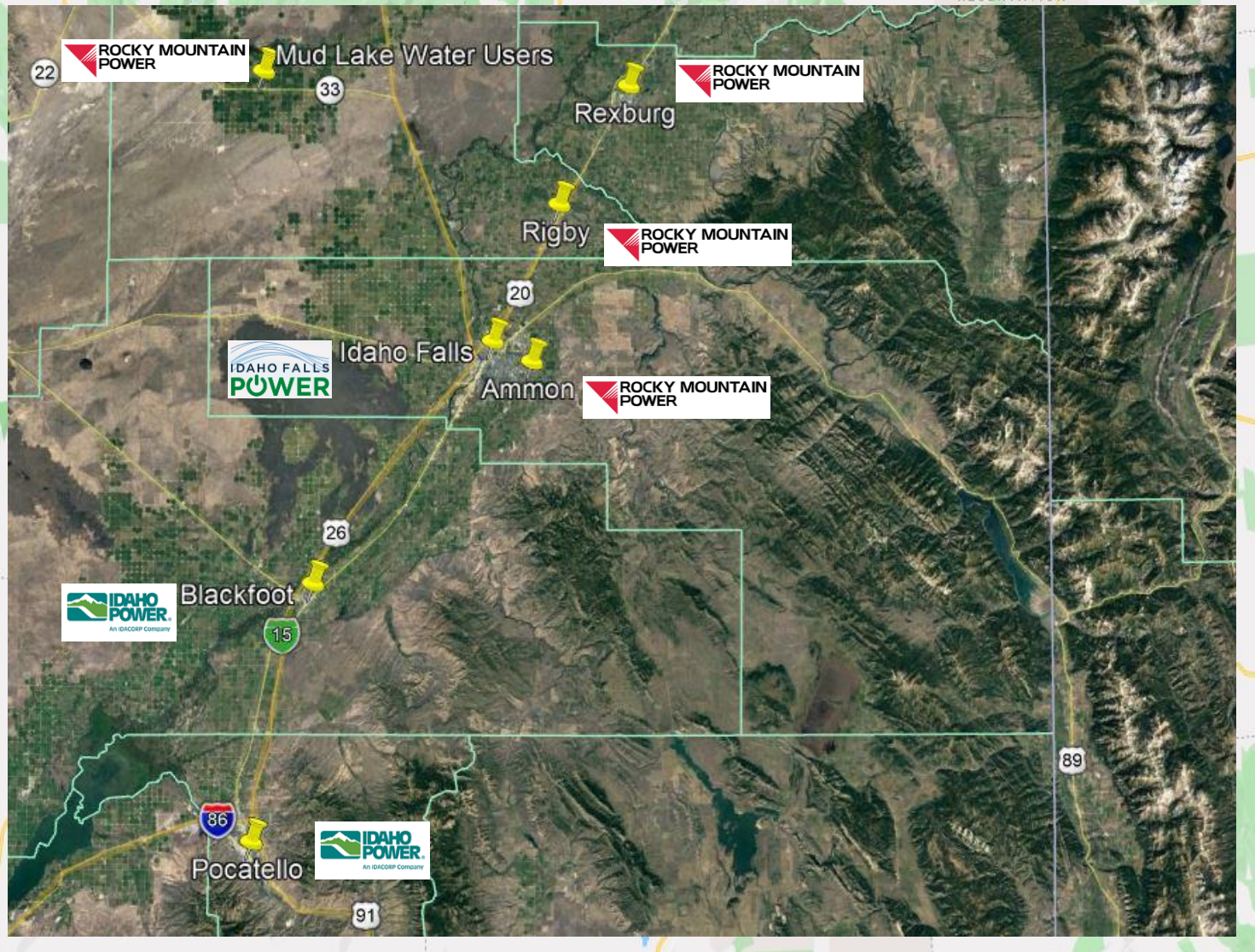
ROCKY MOUNTAIN POWER
Mud Lake Water Users
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ROCKY MOUNTAIN POWER
Rexburg
Rigby
ROCKY MOUNTAIN POWER
20
IDAHO FALLS POWER
Idaho Falls
Ammon
ROCKY MOUNTAIN POWER
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IDAHO POWER
An IDACORP Company
Blackfoot
15
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86
Pocatello
IDAHO POWER
An IDACORP Company
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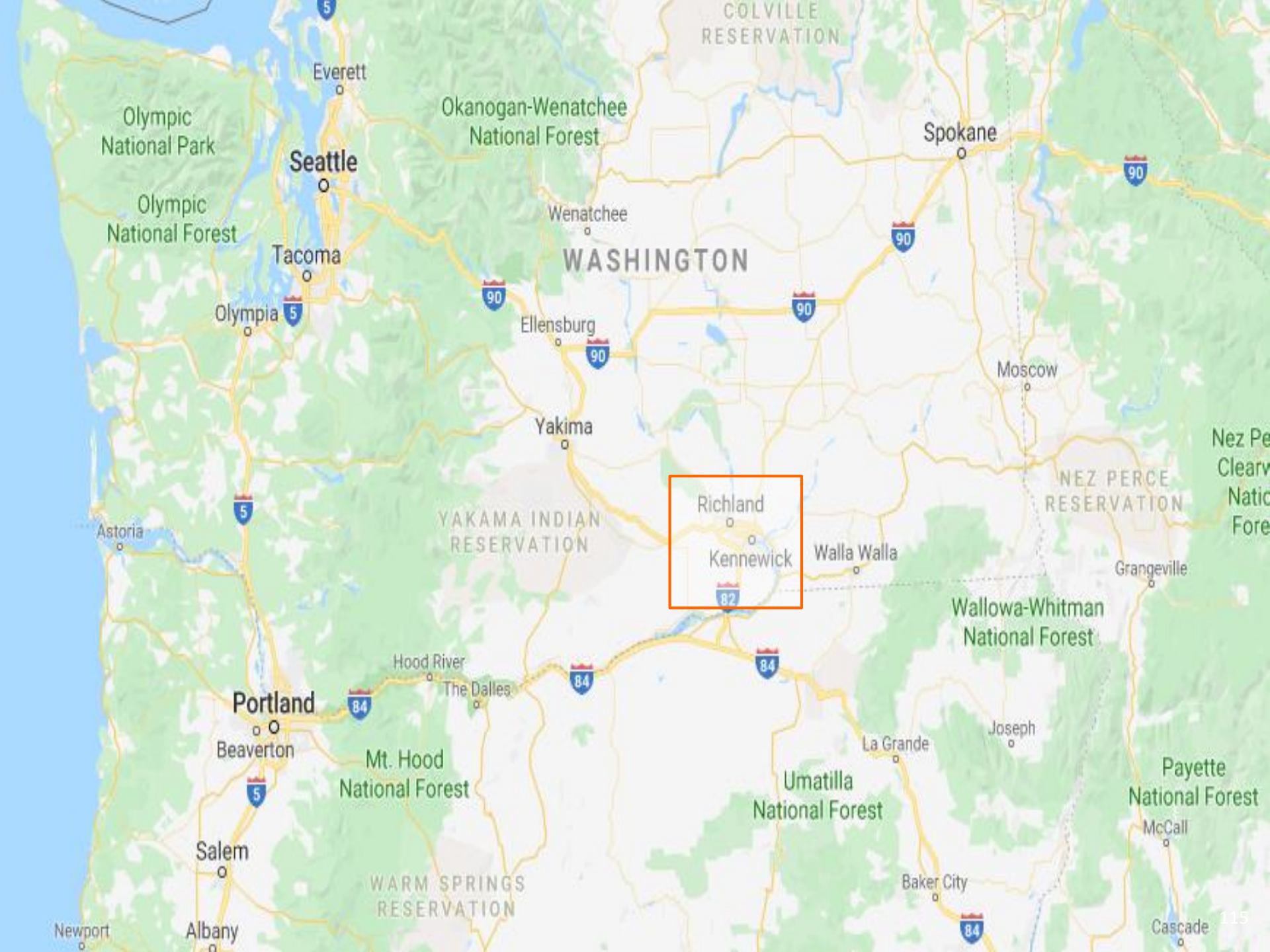
COLVILLE RESERVATION
Everett
Olympic National Park
Seattle
Okanogan-Wenatchee National Forest
Spokane
Olympic National Forest
Wenatchee
WASHINGTON
Tacoma
Olympia
Ellensburg
Moscow
Yakima
Nez Pe
Clearw
Natio
Fore
NEZ PERCE RESERVATION
Richland
YAKAMA INDIAN RESERVATION
Astoria
Kennewick
Walla Walla
Grangeville
Wallowa-Whitman National Forest
Hood River
The Dalles
Portland
Beaverton
Mt. Hood National Forest
Joseph
La Grande
Umatilla National Forest
Payette National Forest
McCall
Salem
WARM SPRINGS RESERVATION
Baker City
Newport
Albany
Cascade
5
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82
84


Ellensburg
City of Ellensburg WASHINGTON
Nob Hill Water Assoc.
PACIFIC POWER
Yakima
PACIFIC POWER
Connell
FRANKLIN PUD
Richland
RICHLAND WASHINGTON
Kennewick
BENTON P·U·D
La Grande
OREGON TRAIL ELECTRIC CO-OP
Image Landsat / Copernicus
© 2018 Google

Exceeded energy savings targets

Built trust with utilities

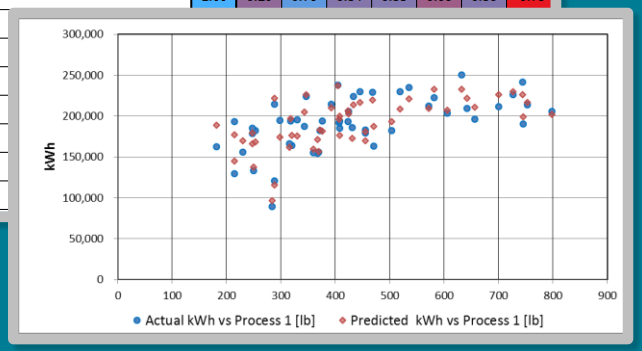
Expand into new sites

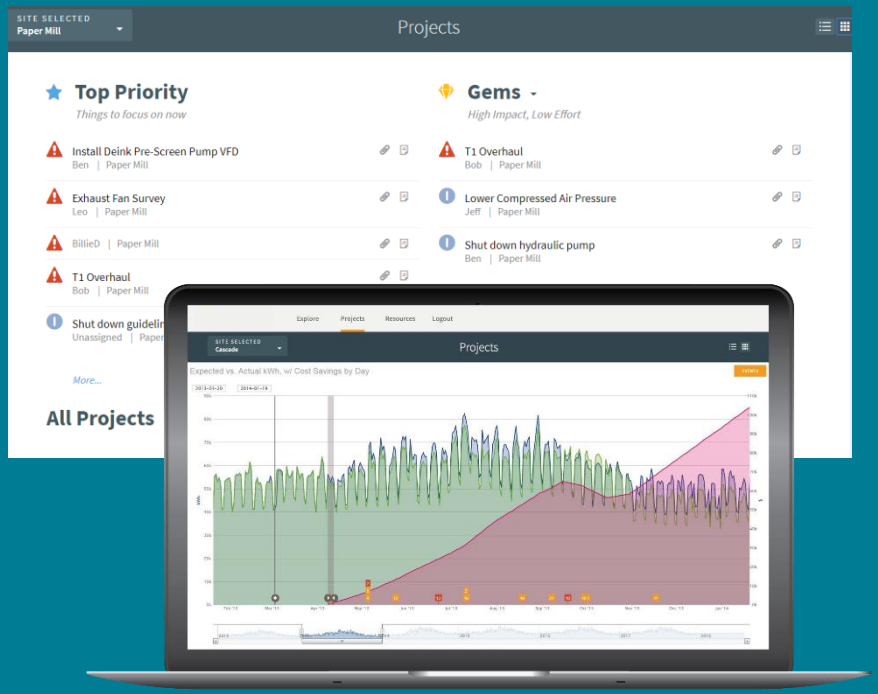
Sole Industry SEM

Technology and SEM

Matrix of Correlation Coefficients: Industrial

	kWh	DB	Shop [hrs]	Office [hrs]	Processing [hrs]	Other [hrs]	Sum [hrs]	P1 [lb]	Machine Time (Shop) [hr]	P2 [lb]	P3 [lb]	P4 [lb]	Total Process [lb]	Christmas/NY
kWh	**1.00**	**0.31**	**0.50**	**0.49**	**0.51**	**0.23**	**0.54**	**0.57**	**0.55**	**0.49**	**0.41**	**0.64**	**0.78**	**-0.55**
DB		1.00	-0.07	0.24	-0.26	-0.33	-0.02	0.08	0.19	-0.10	-0.05	0.18	0.07	-0.33
Shop [hrs]			1.00	0.74	0.89	0.57	0.97	0.22	0.77	0.26	0.42	0.04	0.36	-0.73
Office [hrs]				1.00	0.71	0.15	0.87	0.09	0.68	0.40	0.23	0.02	0.25	-0.65
Processing[hrs]					1.00	0.60	0.92	0.27	0.61	0.40	0.35	0.08	0.36	-0.61
Other [hrs]						1.00	0.54	0.13	0.31	-0.03	0.29	0.18	0.31	-0.33
Sum [hrs]							1.00	0.20	0.76	0.34	0.38	0.06	0.36	-0.73
P1 [lb]														
Machine Time(Shop) [hr]														
P2 [lb]														
P3 [lb]														
P4 [lb]														
Total Process [lb]														
Christmas/NY														





The horizon looks great for SEM

Thank you!

Jeff Hare

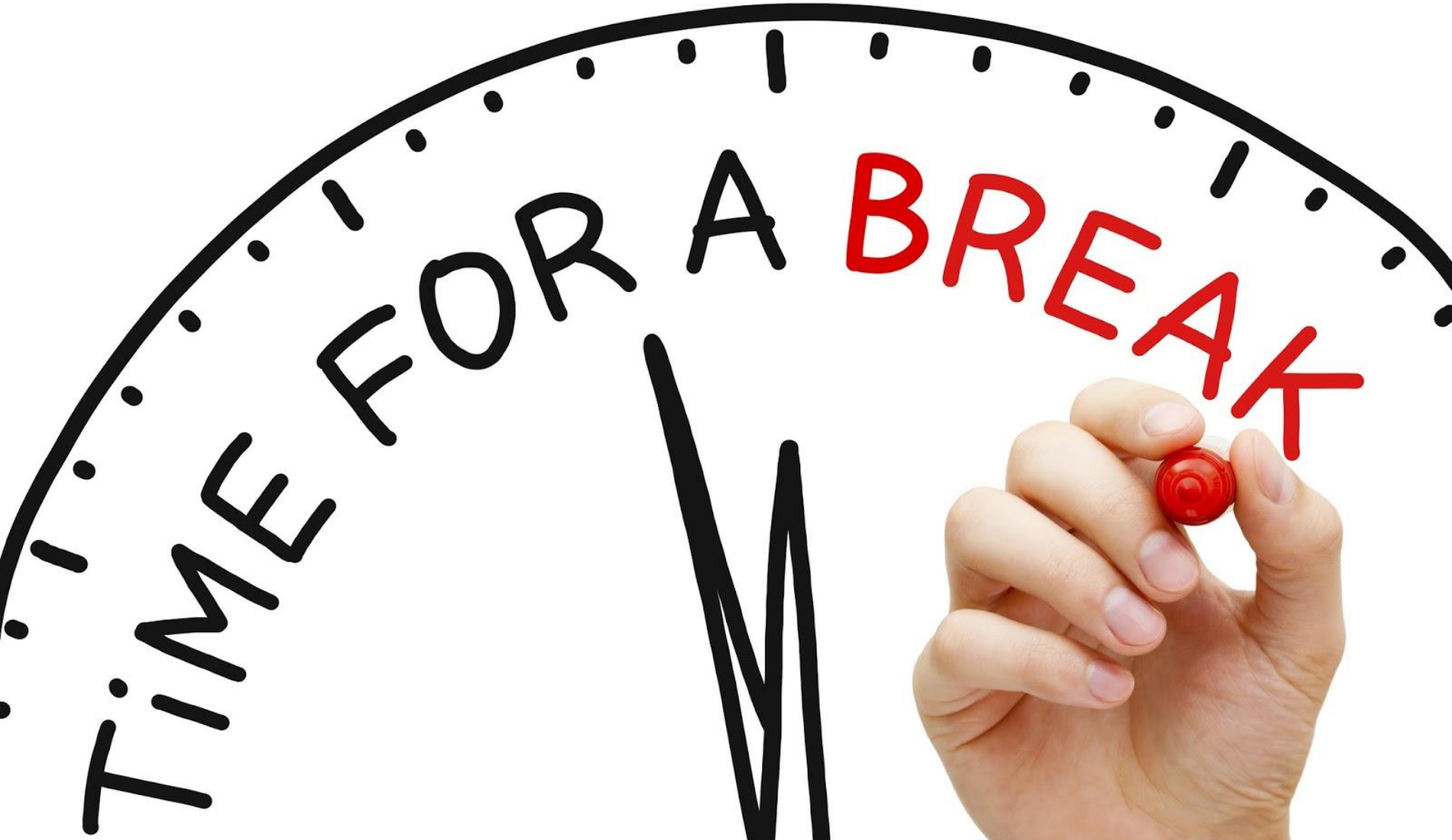
SEM/Aquafficiency Operations Manager

Cascade Energy, Inc.

jeff.hare@cascadeenergy.com

801-995-2982

Cascade Energy®


TIME FOR A BREAK

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VEIC

Cascade Energy®

Efficiency Vermont

Thank you to our Allies

Takeaways From 2019 Northeast SEM Collaborative

- There is a need to understand that state barriers are different from customer barriers. Important to find ways to overcome both.

- Messaging to customers must be very clear:
  - Language that is palatable to customers should be used.
  - Customers should understand the value of SEM programs and not just potential claimable savings.

- Find ways to engage facilities that are on the fence about SEM – introduce them to activities like treasure hunts, etc.

- Leverage benefits that come come from teaming up utilities – sharing best practices, lessons learned, and case studies.

More Takeaways From 2019 Northeast SEM Collaborative

- There is a need to understand differences across states in identifying barriers to energy savings in the industrial, commercial and municipal sectors.
  - Understand problems on a state by state basis, and tailor solutions accordingly.
  - Accept that SEM is not always the solution, especially during the nascent stages of finding solutions – sometimes long-term engagement is required.
- Leverage positive outcomes that can be recognized from customers with multiple facilities.

Questions for Afternoon Session

1. How can we share more successes/challenges among Northeast programs?
2. What are reasons customers do not enroll in the program? How can we adress them?
3. How can we engage facilities that are on the fence about SEM? (introduce them to activities like treasure hunts, etc.)
4. What are some SEM state barriers? Customer barriers? What are some ways in which we can overcome both?

Thank You!

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