IAC

Industrial Advisory Committee

July 25, 2018



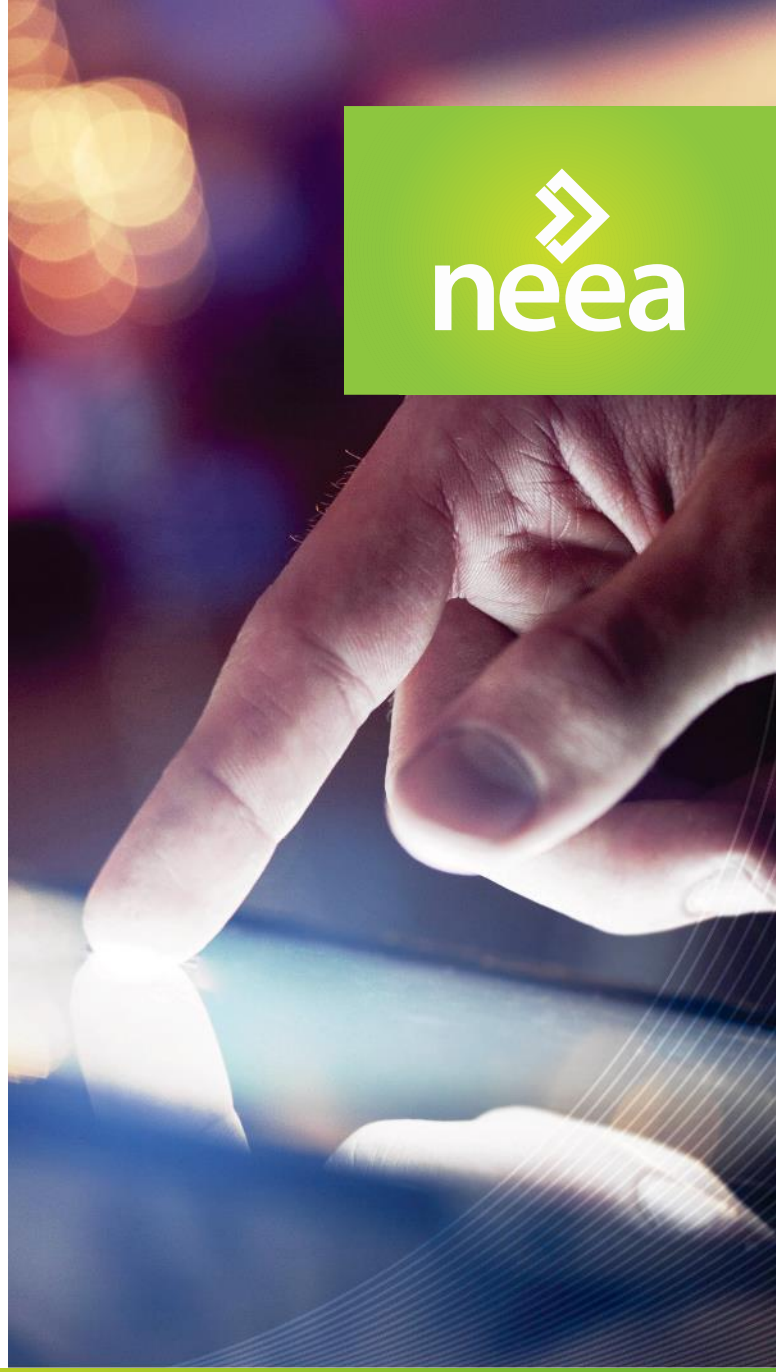
Agenda

Time	Topic
10:00 –10:20	WELCOME AND INTRODUCTIONS
10:20 – 10:50	**PORTFOLIO OVERVIEW UPDATES** • Industrial Portfolio Update • NEEA 2020-24 Business Planning Update • 2019 Operations Planning Update
10:50 - 11:20	**SEM HUB ENERGY MANAGEMENT ASSESSMENT DEMO**
11:20 -12:05	**UTILITY SHARE OUTS/ROUND ROBIN**
12:05 –12:45	***Lunch (provided)***
12:45 – 1:30	**EMERGING TECH Scanning Update** • Short updates on emerging tech for industrial applications
1:30 – 2:45	**CONTINUED DISCUSSION from Q2: INDUSTRIAL SECTOR TRENDS, CHANGES, OPPORTUNITIES** • Water and Wastewater Treatment • Interest and value in utilizing the IAC forum in the future to explore other themes or topics
2:45 – 2:50	**OPPORTUNITY FOR PUBLIC COMMENT**
2:50 – 3:00	**NEW FOLLOW-UP ACTIONS & FEEDBACK / ADJOURN**
3:00	**ADJOURN**

July 2018

Industrial Portfolio Update

Emily Moore

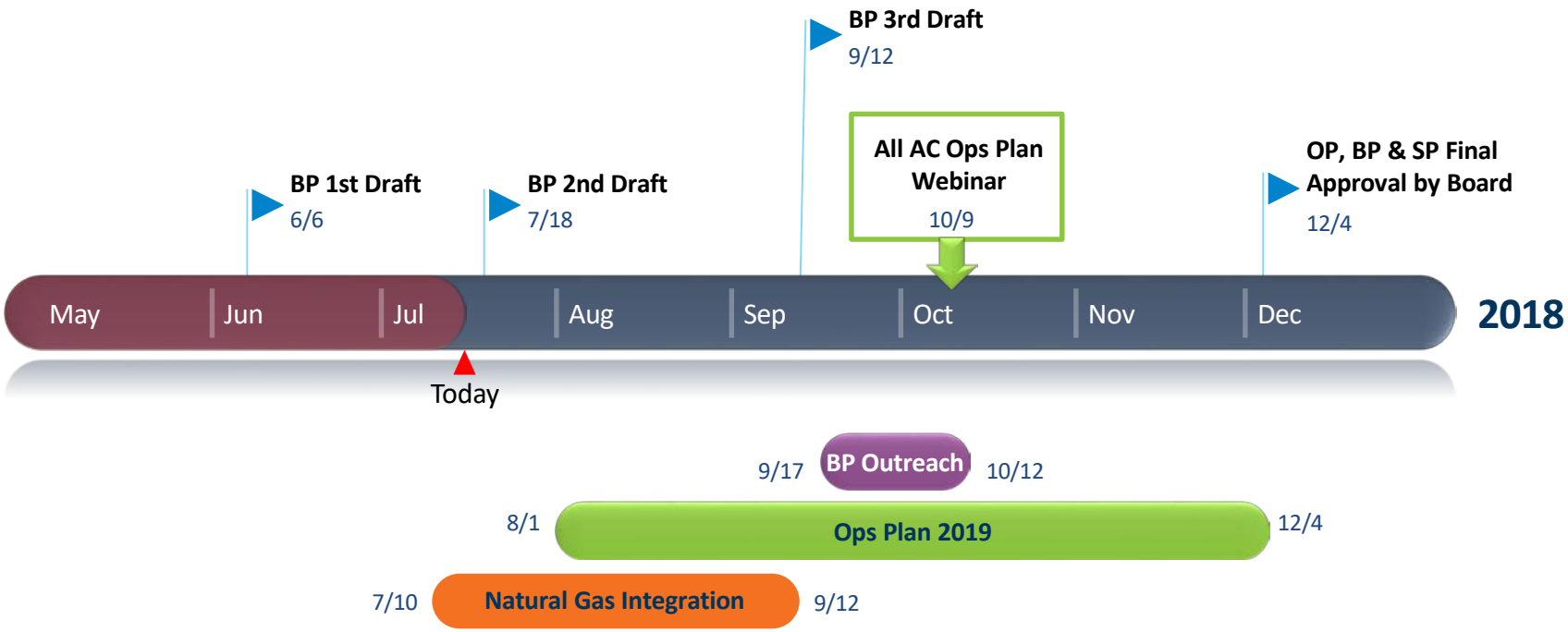


Program	Q3 Update

Extended Motor Products 	• Launched XMP Pumps Research Plan and Technical Work Group
	  • Validate energy savings estimates for commercial and industrial pumps and circulators
	  • Create a regional database of pump energy and performance data

C/I Strategic Energy Management 	• EMA tool updated and available for customization • Conducted 50001 Ready workshops in Seattle and Portland, with funding from LBNL/DOE • Working with Idaho Power and two Idaho school districts on Community SEM, with funding from NREL/DOE • Kicked off planning for 8th annual Fall workshop of NW SEM Collaborative
Industrial Technical Training 	• To-date in 2018, 5 training courses delivered to 102 individuals • 5 additional training courses are scheduled for remainder of the year

Business and Operations Planning Timeline



Industrial Changes in draft 2020-24 Business Plan

- Motor-driven Products is a *Portfolio Category*
  - Focus of XMP initiative is clean water pumps and circulator pumps below 50 hp
  - Continue to explore opportunity for other motor-driven products, such as fans and compressors

- ITT Infrastructure not continued
  - Would transition curriculum and resources to interested utilities at end of this cycle
  - Continue training that directly supports MT initiatives

- C+I SEM Infrastructure offered optionally to funders
  - 'Critical mass' of funders would be needed to support SEMHub and regional resources

SEM Hub Energy Management Assessment Demo



July 2018

SEM Hub Tools & Resources

Warren Fish
Rachel Zakrasek
Nick Leritz



NEEA's Current Roles in SEM

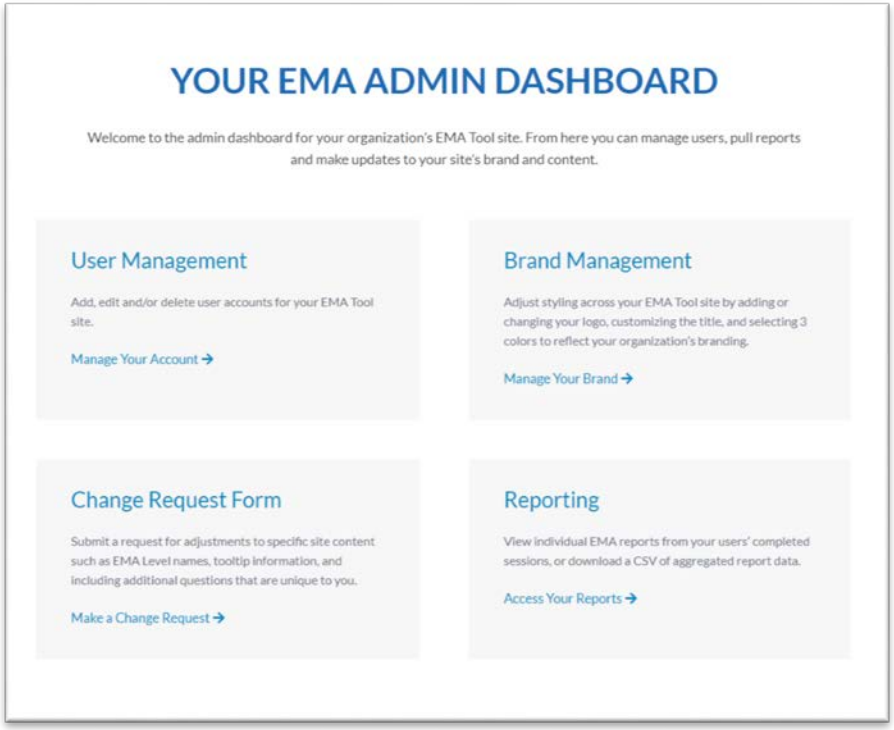
- Convene an active community of SEM practitioners and deepen their capabilities by teaming up to tackle shared challenges
- Gather, vet and maintain available SEM tools and resources, and offer them in a configurable platform that plugs and plays with programs

SEM Hub:
EMA & LMS Demonstration

Energy Management Assessment (EMA) Tool

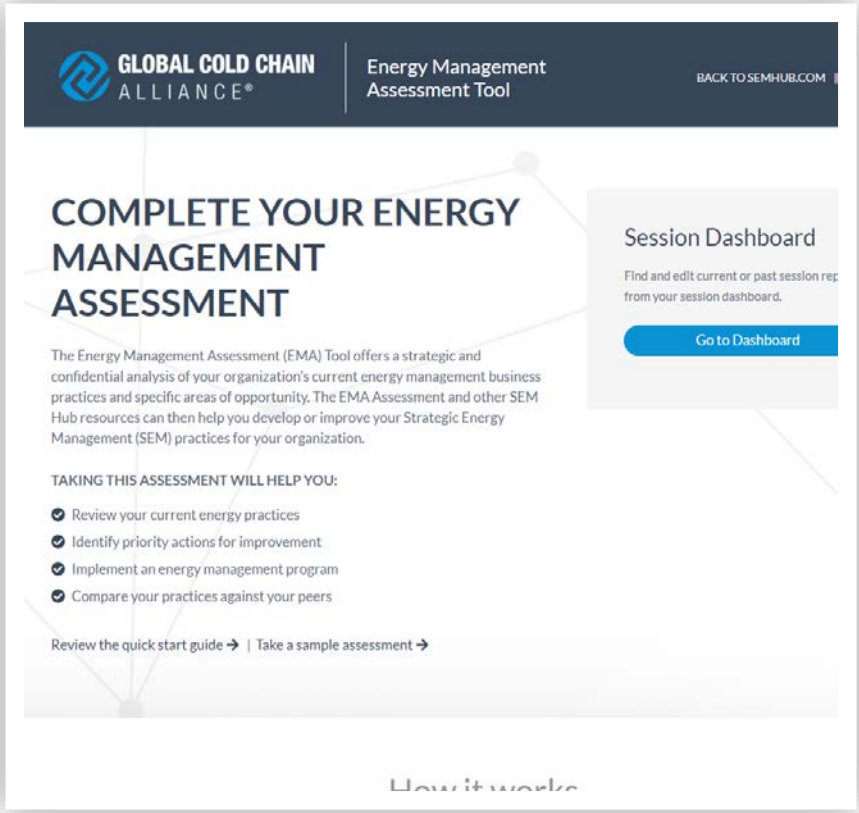
- Newly updated and improved
- Customizable
- NEEA owned for sustainable management

EMA Updates and Improvements



- Improved user experience
- Customization
- Admin dashboards
- Reporting

Customizable EMA



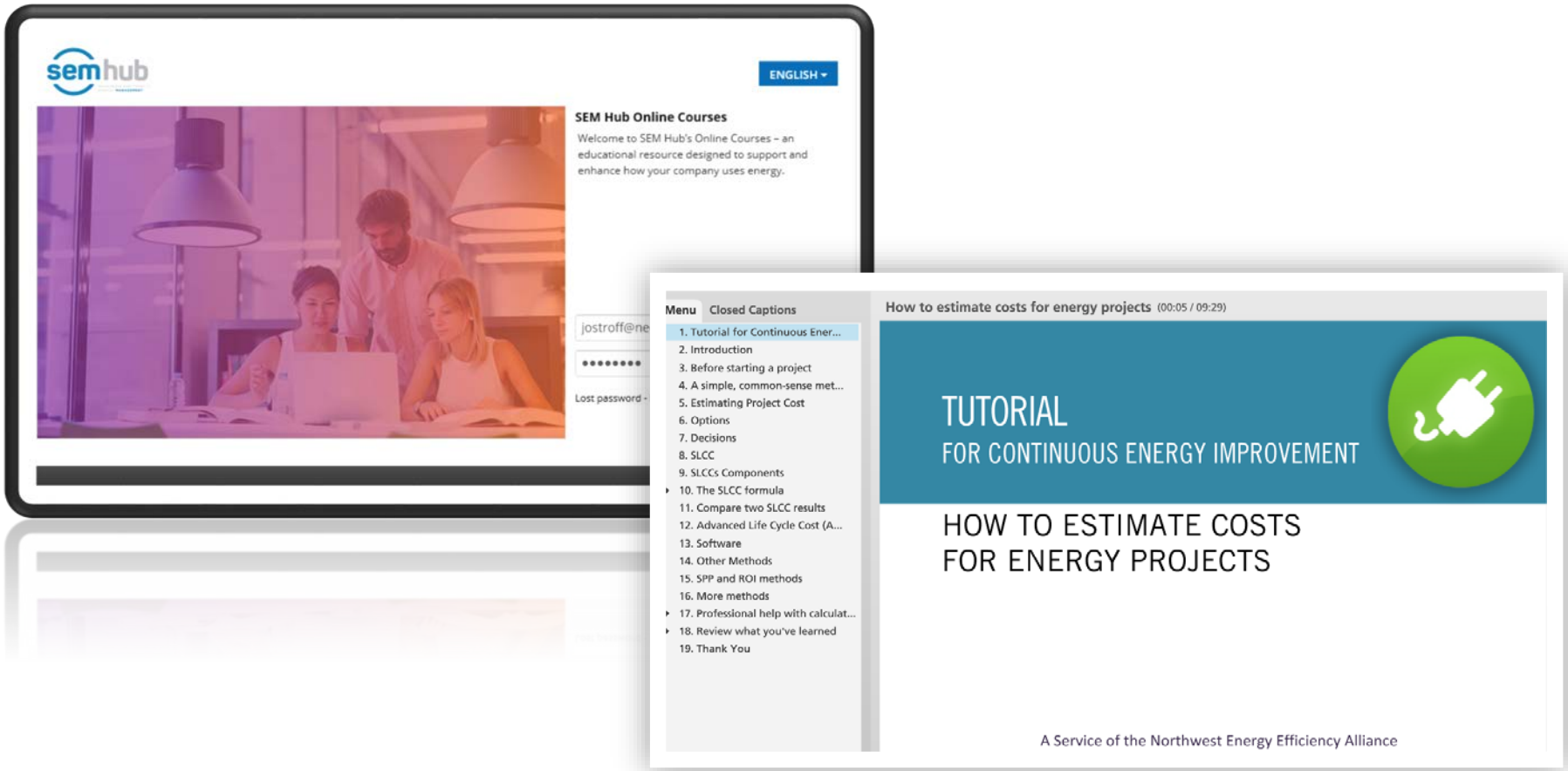
- Domain
- Logo and branding
- Terms & Conditions
- Admin dashboard enables user management and reporting

EMA Tool Demo

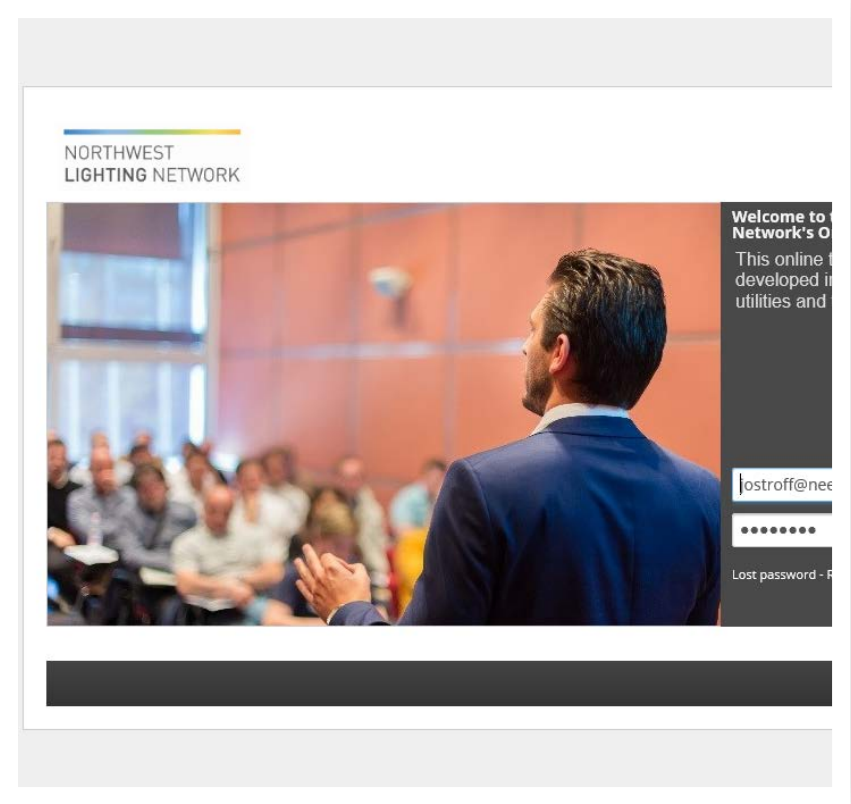
SEM Online Courses via Learning Management System (LMS)

- 17 online courses available to any user
- Customizable LMS platforms

SEM Hub Online Courses



Customizable LMS Platforms



- Domain
- Logo and branding
- Home page content
- Pick and choose SEM Hub online courses
- Add your own resources and learning modules

LMS Platform Capabilities

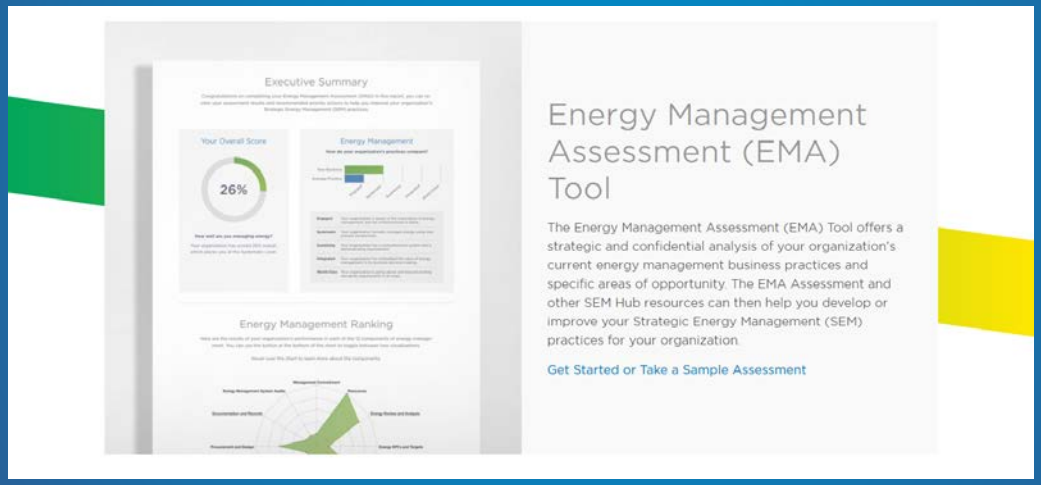
- Formal and informal learning
- Administer surveys, tests and assignments
- Hold webinars
- Award certificates & CEU's
- Dashboard & reporting features
- Custom registration
- Custom email notifications
- Newsletter capability
- And much more!

LMS Demo

JOIN THE DEMO:
August 22, 2018, 2:00-3:00 pm
https://neea.adobeconnect.com/_a1100903420/r7iofzxuifgs/

Learn more at: **SEMHUB.com**

www.semhub.com



TOGETHER We Are Transforming the Northwest

AVISTA
Bonneville Power Administration
Cascade Natural Gas Corporation
P.U.D. Chelan County
Clark Public Utilities
EnergyTrust of Oregon
Grant PUD
IDAHO POWER. An IDACORP Company
NorthWestern Energy
NW Natural
PACIFIC POWER
PGE
PSE Puget Sound Energy
Seattle City Light
Snohomish County PUD Public Utility District No. 1
Tacoma Power Tacoma Public Utilities

Round Robin Share-out



Lunch is being served

IAC

Emerging Technology Presentations

Geoff Wickes, NEEA

Mark Rehley, NEEA



Air Saver Nozzle

Air Saver Unit ASC/ ASV Series

Easy solution to your environment protection efforts !
Air Saving unit contributes to power savings
and CO_2 reduction

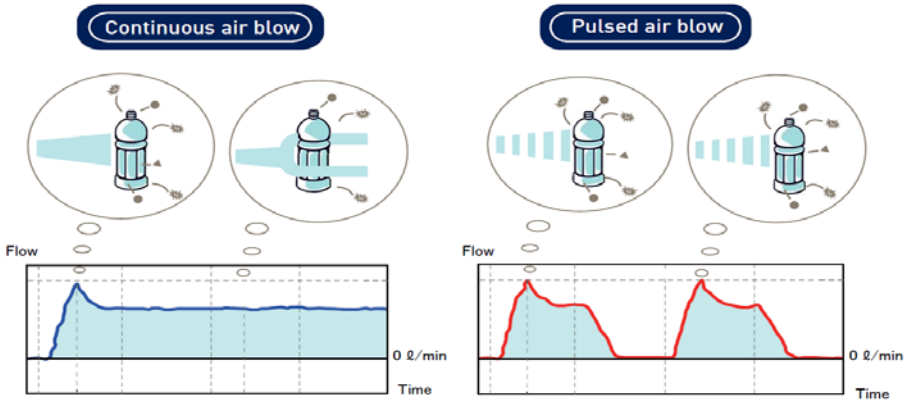
ENGINEERING YOUR SUCCESS.

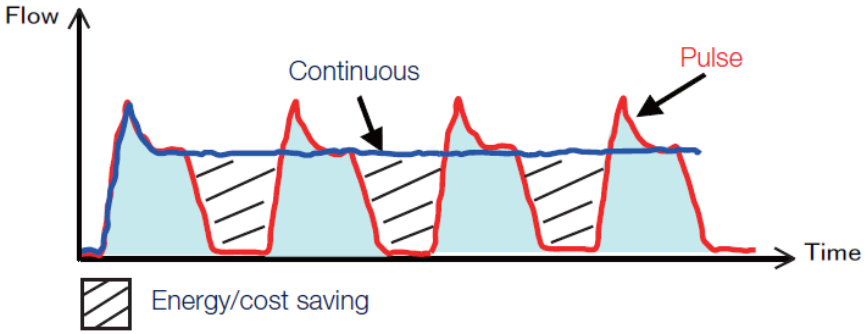
October, 2015

Air Saver Unit

How does it work

- Converts continuous air flow into pulse blow
  - Reduces consumption of compressed air
  - Potentially reduces overall system pressure
  - Improved the impulse of air blow resulting in higher efficiency

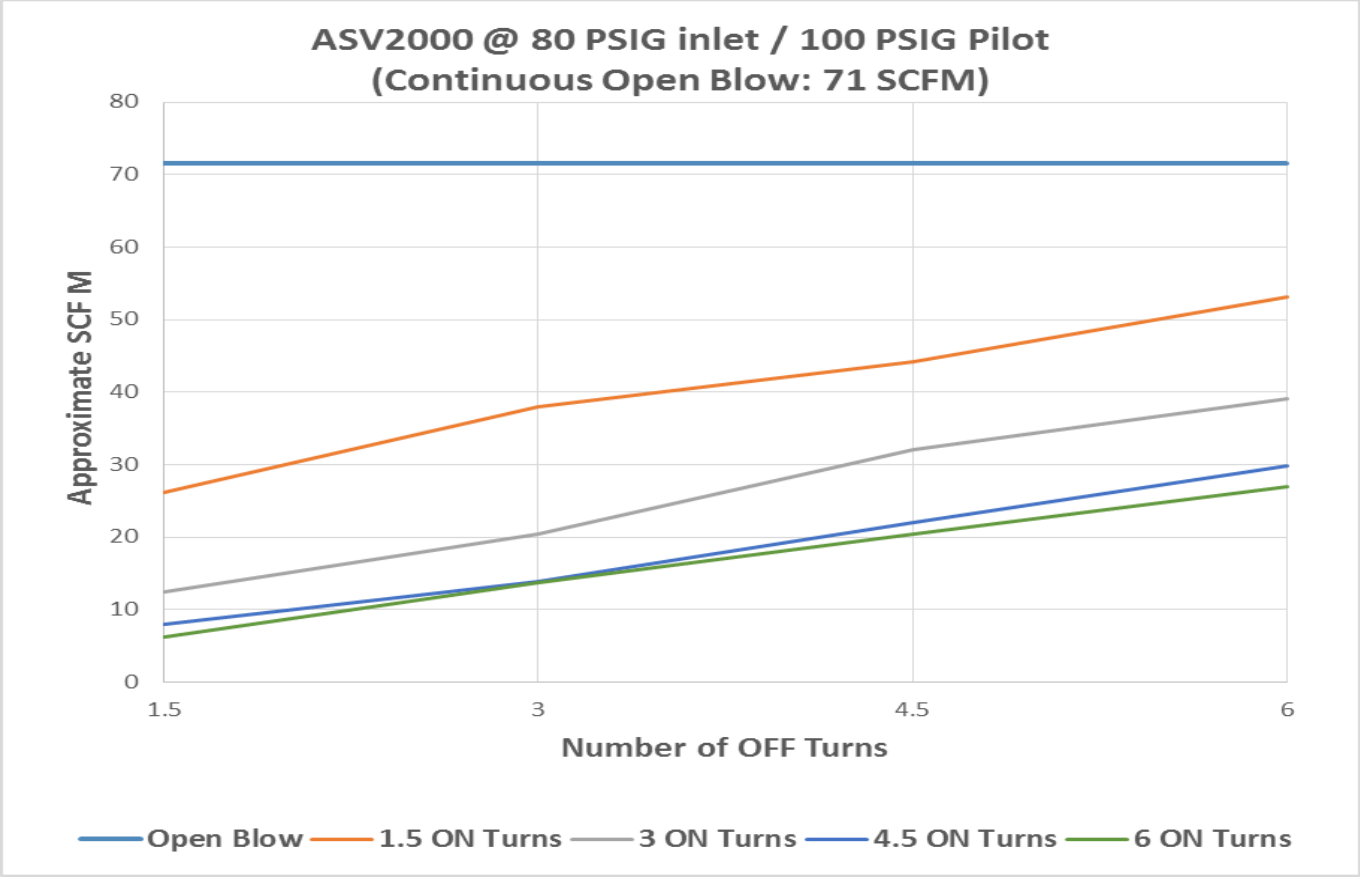




Study Done by SBW

- Good savings potential
- Lots of applications
- Improved productivity and quality
- Regional savings potential
- Direct to utility program with stock and flow data back to the region

Preliminary Findings– Flow Reduction



Preliminary Findings – Cost Effectiveness

ASU model	Rated Flow (cfm)	ASU List Price ($)	Nominal Install Cost ($)	Total Cost ($)	Flow Reduction (%)	Flow Reduction (cfm)	Energy Savings ($/year)	Simple Payback (years)
ASV200	5.3	$255	$240	$495	57%	3.0	$165	3.0
ASC500	15.9	$398	$240	$638	25%	3.9	$213	3.0
ASO500	15.9	$398	$240	$638	25%	3.9	$213	3.0
ASV2000	70.6	$429	$240	$669	6%	4.1	$223	3.0
ASV5000	176.6	$461	$410	$871	3%	5.3	$290	3.0
ASV13000	459.1	$930	$410	$1,340	2%	8.2	$447	3.0
ASV15000	529.7	$1,225	$410	$1,635	2%	10.0	$545	3.0

20 Year Potential Regional Savings Estimate

Pacific Northwest Annual Electric Demand and Consumption

	Percent	aMW	GWh
Total Pacific NW Electric Demand & Consumption[1]	100%	20,000	175,200
Industrial Share of Total[2]	19%	3,800	33,288
Compressed Air Share of Industrial[3]	12%	456	3,995
Blowing End Use Share of Compressed Air[4]	15%	68	599
Potential Penetration of Blowing End Uses Over 20 Years[5]	30%	20.5	180
Potential Average ASU Savings[6]	30%	**6.2**	**54**

Sources:
1 - aMW value from NWPPC 6th Plan; GWh value assumes 8760 hours/year at aMW
2 - Percent value derived from NWPPC 6th Plan
3 - Percentage derived from USDOE Advanced Manufacturing Office 2010 report by Energetics, Inc.
4 - Percentage estimated based on field experience
5 - Cumulative savings over 20 years - percentage is estimated
6 - 30% potential savings is a conservative estimate based on manufacturer's estimate of 40%

Next Steps: ASU Field Tests- Engaging with Energy 350

- Objectives
  - Measurement based analysis of ten sites
    - » Compressed air savings
    - » Cost effectiveness
  - Observe end-use effectiveness
  - Determine customer acceptance
- Process
  - Participant recruitment
  - Baseline & Efficient case measurements
  - Analysis & reporting with recommendations

Target Markets

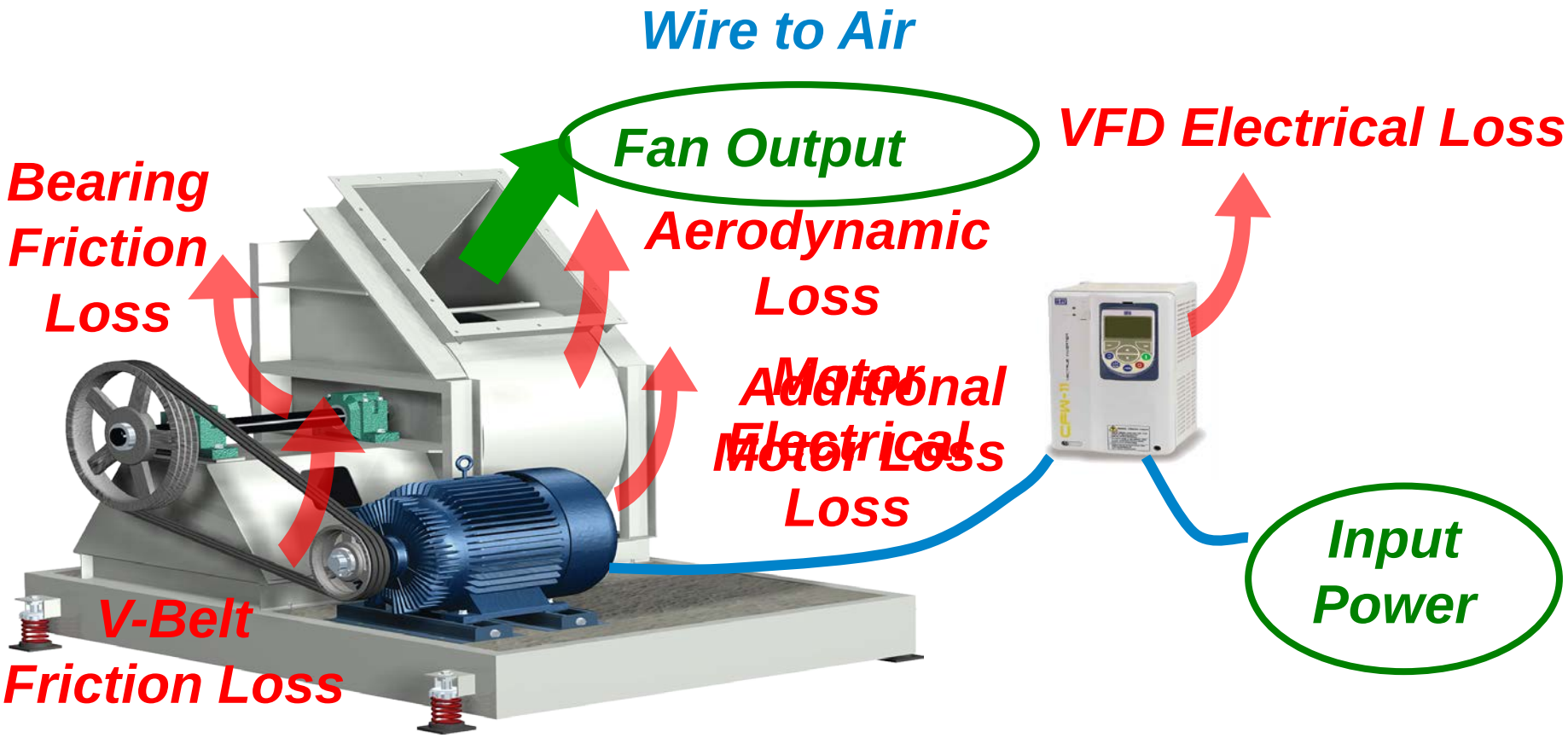
- Food Processing
- Timber Products
- Secondary wood processing
- Machine, tool and die
- Aerospace
- Paint shops
- Semi-Conductor

Further Steps (as warranted)

- Prepare Performance Specification based on flow interruption
- Development of RTF Measures
- Informational & Educational Outreach
- Shipment data information

XMP Fans Update

Why Fans


Wire to Air
Fan Output
VFD Electrical Loss
Bearing Friction Loss
Aerodynamic Loss
Motor Additional Electrical Motor Loss Loss
Input Power
V-Belt Friction Loss

XMP Overview

The Extended Motor Products (XMP) Initiative's goal is to drive lasting awareness, stocking, and sales of efficient motor driven products

New Equipment Labels + **New Mid-Steam Utility Incentives** = **Energy Efficiency Opportunity for Motor Driven Equipment (FEI)**

Background: Who's Involved

There have been activities on multiple fronts working to drive adoption of more efficient motor driven products

New Equipment Labels + **New Mid-Steam Utility Incentives** = **Energy Efficiency Opportunity for Fans**

DOE and **California Energy Commission** Rulemakings provide robust technical foundation for testing, labeling, and analysis

RTF and **NEEA** establish Deemed Planning Measures for C&I Pumps and Circulators

Regional Technical Forum

Manufacturers and Industry Associations (**Air Movement and Control Association; AMCA**) provide test procedures and rating system for certified performance and labeling

Background: Where We Are

Building on regulatory and industry efforts to developing testing and labeling procedures, next step is to develop incentives

New Equipment Labels + **New Mid-Steam Utility Incentives** = **Energy Efficiency Opportunity for Fans**

- **AMCA** test procedures and labeling standards complete
- **DOE** and **CEC** rulemaking analysis complete (DOE rulemaking on hold; CEC significantly underway)

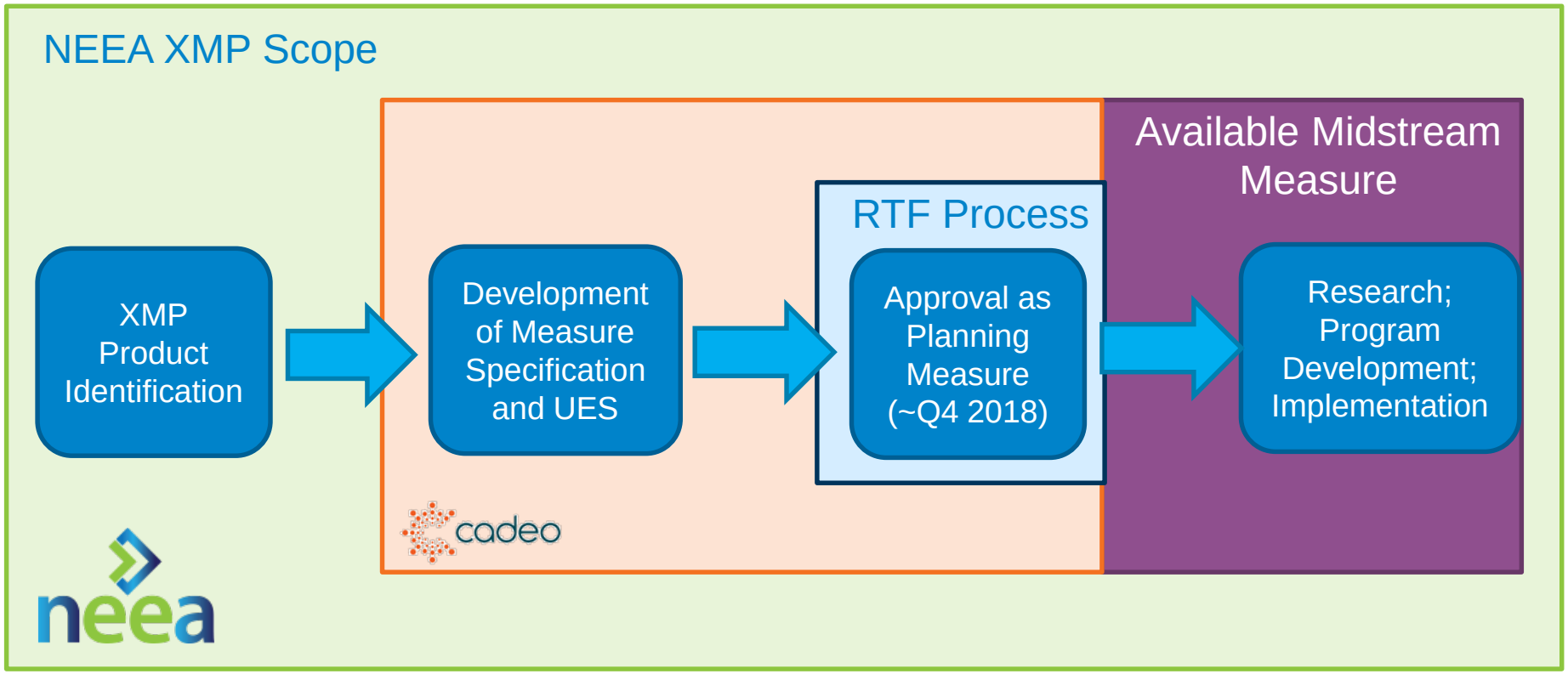
- **RTF** and **NEEA** establish Deemed Planning Measures for C&I Pumps and Circulators

- **NEEA** and **Utilities** develop and implement mid-steam incentive program; partnering with **manufacturers, distributors, trade association**

neea

Process: Next Steps

NEEA is partnering with Cadeo and RTF to develop deemed Unit Energy Savings Estimates for Fans



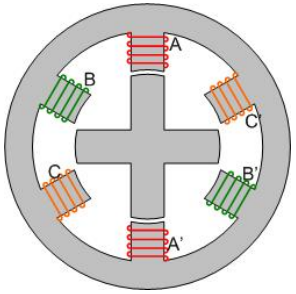
Benefits of Fan Energy Index(FEI)

1. FEI will drive energy savings 2 ways:
   A. *Manufacturers will improve Fan Designs*
   B. *System designers can make better Fan Selections*
2. FEI can be used with all fans
3. FEI is a good comparison of relative **energy** consumption
   A. *Incentive programs can be designed with minimal market friction*
   B. *Potential midstream intervention solution*
4. *Will help improve long term efficiency standards (DOE)*

Switch Reluctance Motors

Switched Reluctance Motors

Switched Reluctance Motors



Features

- Rotor contains no windings, rare earth materials or magnets
- Power is delivered to windings in the stator
- Requires fast switching power electronics
- Position feedback is required to time the stator switching operations with that of the rotor

Attributes

- Simple and rugged
- Lower rotator losses
- Less heat produced at full torque
- Runs cooler normally and heat is limited to stator
- Efficient operation over wide load percentages
- Wide range of RPMs
- Able to operate in high temperature environments

Energy Savings Potential

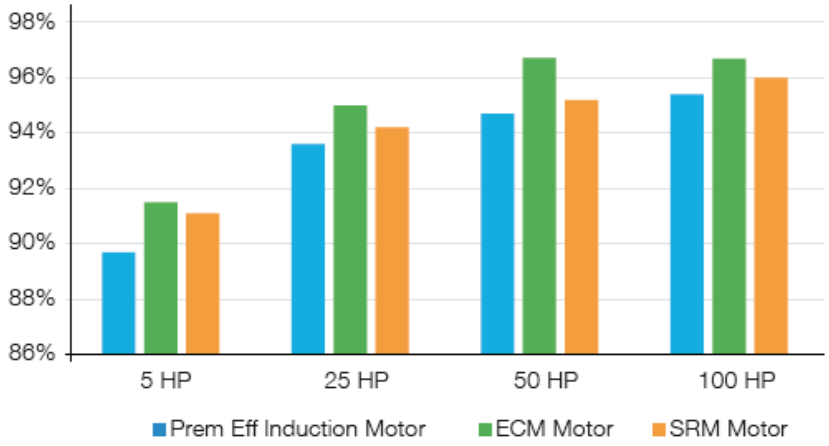
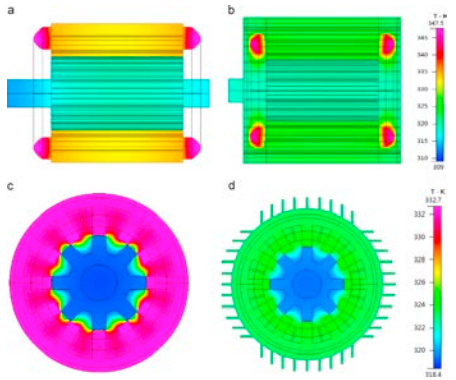


Figure 10: A Comparison of the Efficiencies of All Three Motors



Discussion:

Industrial Sector Trends, Changes, Opportunities

Mark Rehley



Water and Wastewater

- What is the current level of interest and program activity at your organization?
- What technologies or products are you supporting and/or interested in?
- In what specific ways could better regional collaboration support your organization?

NEEA IAC Meeting BPA Slides

July 25, 2018

Erin Hope & Todd Amundson
Bonneville Power Administration

Energy Smart Industrial
BPA ENERGY EFFICIENCY

An Evolving Approach to Water/Wastewater Energy Efficiency

2001 - 2006

NEEA/BacGen initiative

6 site pilot, 12 projects complete

2010-2015

- Water/Wastewater Sector Specialists
- 63 Custom Projects
- HPEM pilot

2016-Current

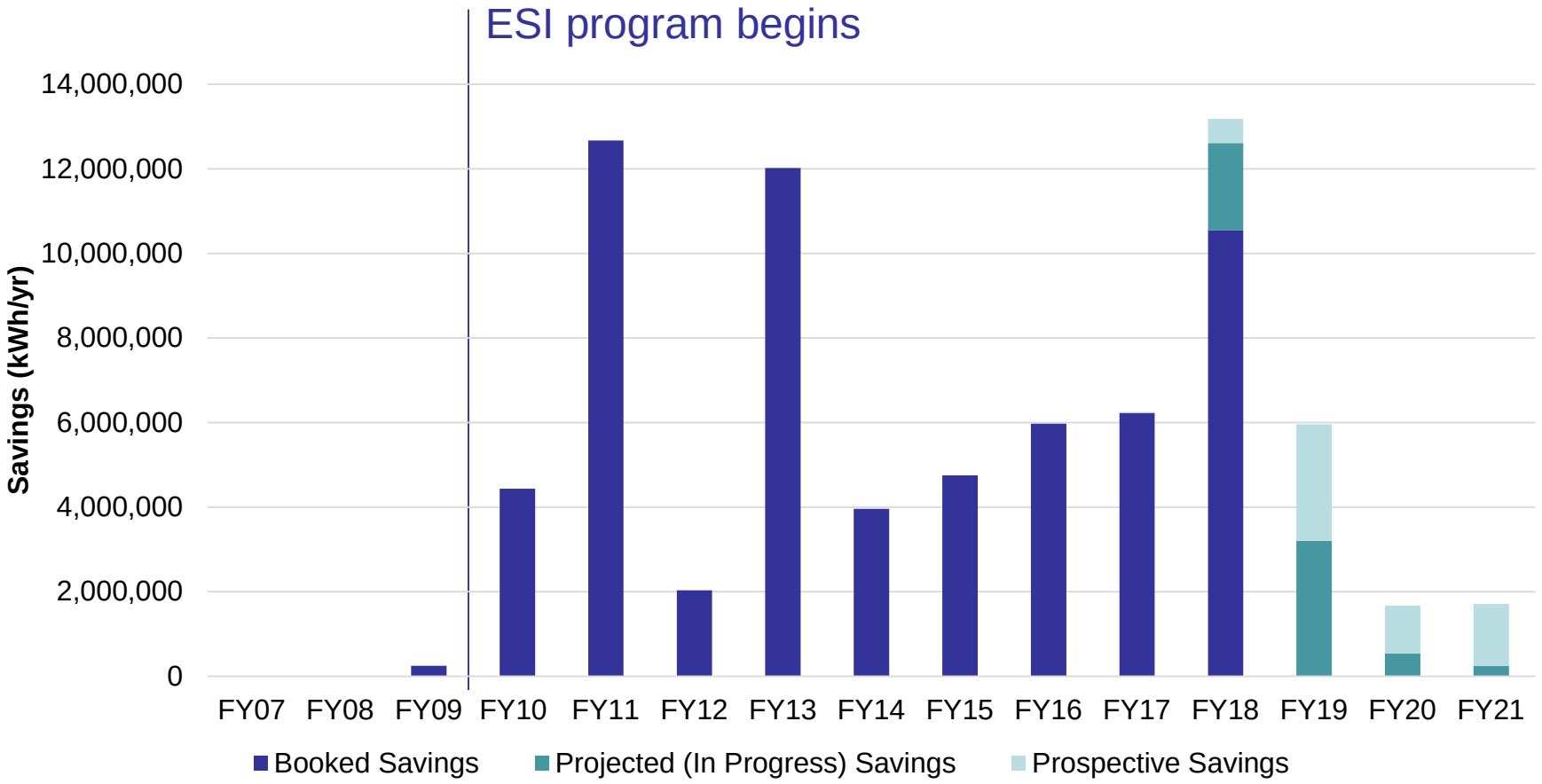
- Water/Wastewater Specific SEM Cohorts
- Emphasis on training and persistence

Energy Smart Industrial
BPA ENERGY EFFICIENCY

NEEA, BPA, BacGen Initiative

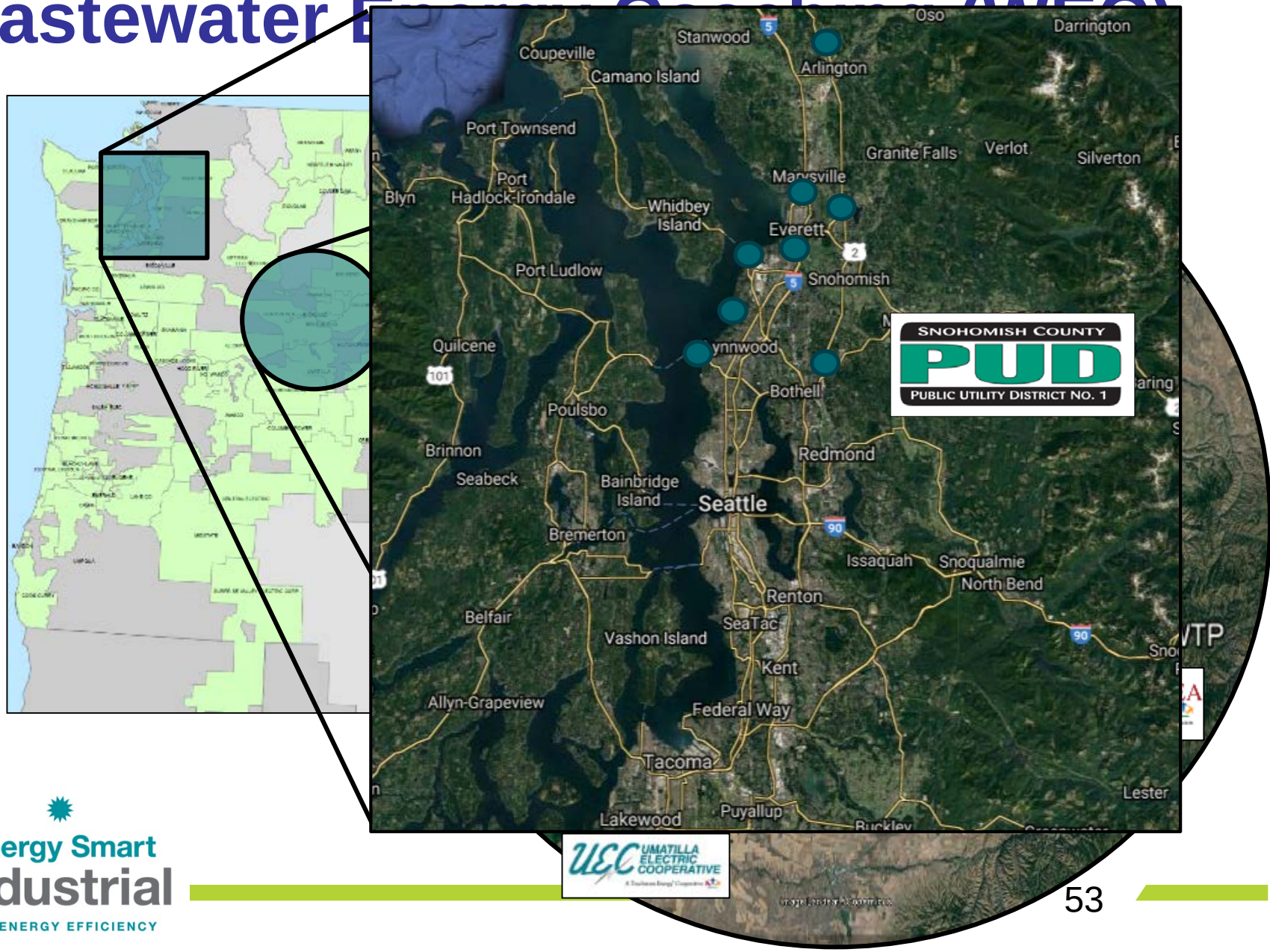
- Direct acquisition program, providing energy services financing to W/WW facilities
- 20 sites participating, 12 projects measured and verified
- 5.9 million kWh savings achieved
- 30 pipeline opportunities identified

ESI W/WW Savings Results



Energy Smart Industrial
BPA ENERGY EFFICIENCY

Wastewater E



Energy Smart Industrial
BPA ENERGY EFFICIENCY

WEC savings results

Cohort	kWh	% Savings
2016 Columbia Basin WEC	2,183,349 (site savings) 2,381,073 (busbar)	17% annual consumption
2017 Puget Sound WEC	4,490,000 (site)* 4,896,614 (busbar)*	7.0%

*Predicted. Year 1 reports are in progress.

Looking Ahead

- New technologies – discussed in cohort groups and at trade conferences. Some examples from PS WEC WS 4
  - Pulsair Compressed Air Mixing http://wastewater.pulsair.com/video/
  - In Situ Diffuser Cleaning www.cleaninfusion.com
  - Pumps and mixers with integral VFDs
  - Smart controllers and smart pumps
  - Linear Mixers
- More water cohorts
- Strategize to reach smaller and more rural areas

Water and Wastewater

- What is the current level of interest and program activity at your organization?
- What technologies or products are you supporting and/or interested in?
- In what specific ways could better regional collaboration support your organization?

Moving Forward

Level of interest and the value in utilizing the IAC forum in the future to explore other themes or topics in greater depth

Public Comment & Wrap-up

Eugene Rosolie




break