

BPA ESI Program Overview

This publically available presentation, given by BPA Ag/Industrial Sector Lead, Jennifer Eskil provides updated program savings, and an introduction to ESI's newest offering, Small Industrial High Performance Energy Management (SI HPEM). The initial SI HPEM cohort is fully enrolled in middle of its first year – with several encouraging signs of success so far.

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Energy Smart Industrial Program

by

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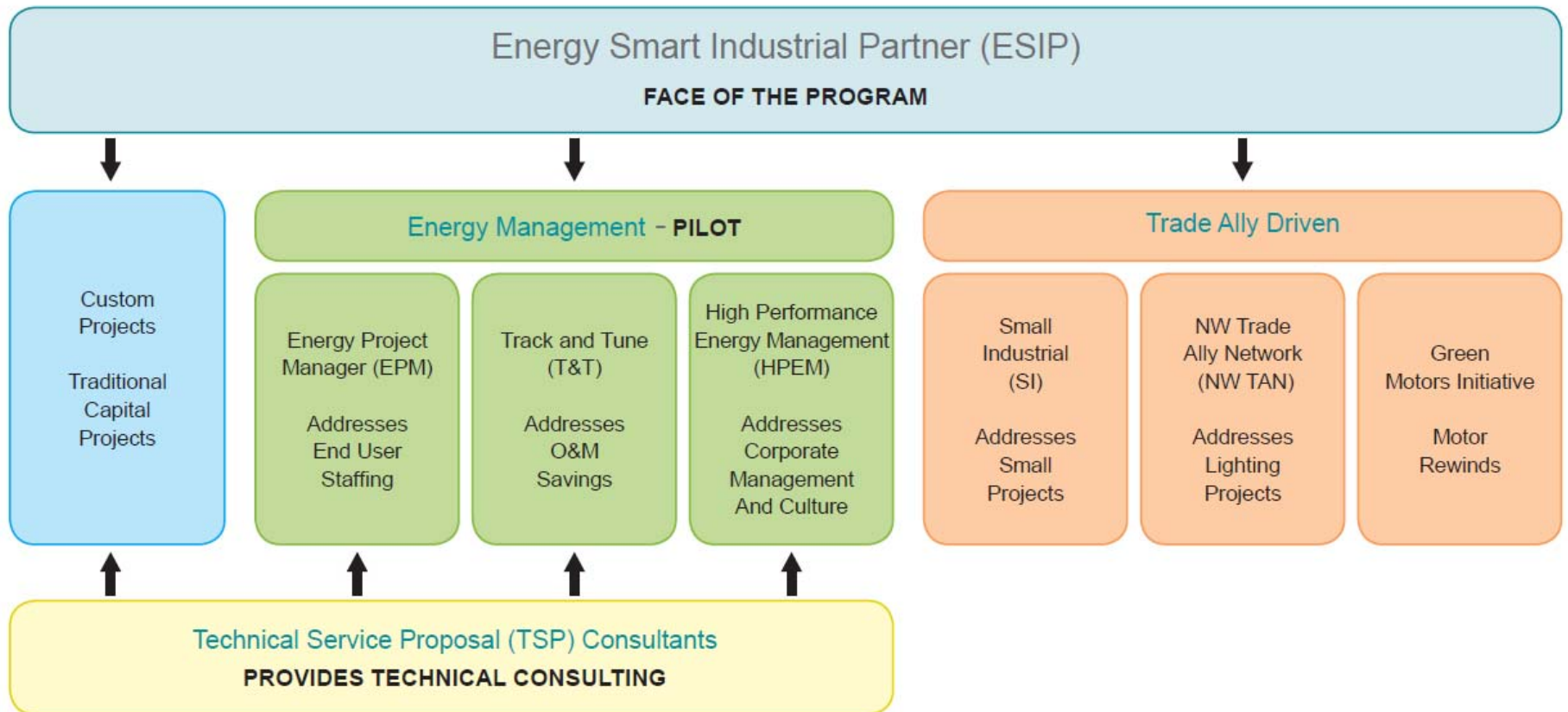


Who is Bonneville?

- Federal Power Marketing Agency – Department of Energy (e.g., WAPA).
- Been around since 1937 – 77 years young!
- Service area covers Idaho, Oregon, Washington and Western Montana; also portions of California, Nevada, Utah and Wyoming.
- Markets and transmits power generated from the Federal Columbia River Power System¹ (FCRPS).
- Generates over 9,500 aMW of energy annually.
- Self-financed over \$3.3B/yr. and pays US Treasury \$1B/yr.

¹FCRPS includes 31 Federal hydro project dams, 1 non-federal nuclear plant and several small non-federal power plants (and wind generation); all are carbon-free!

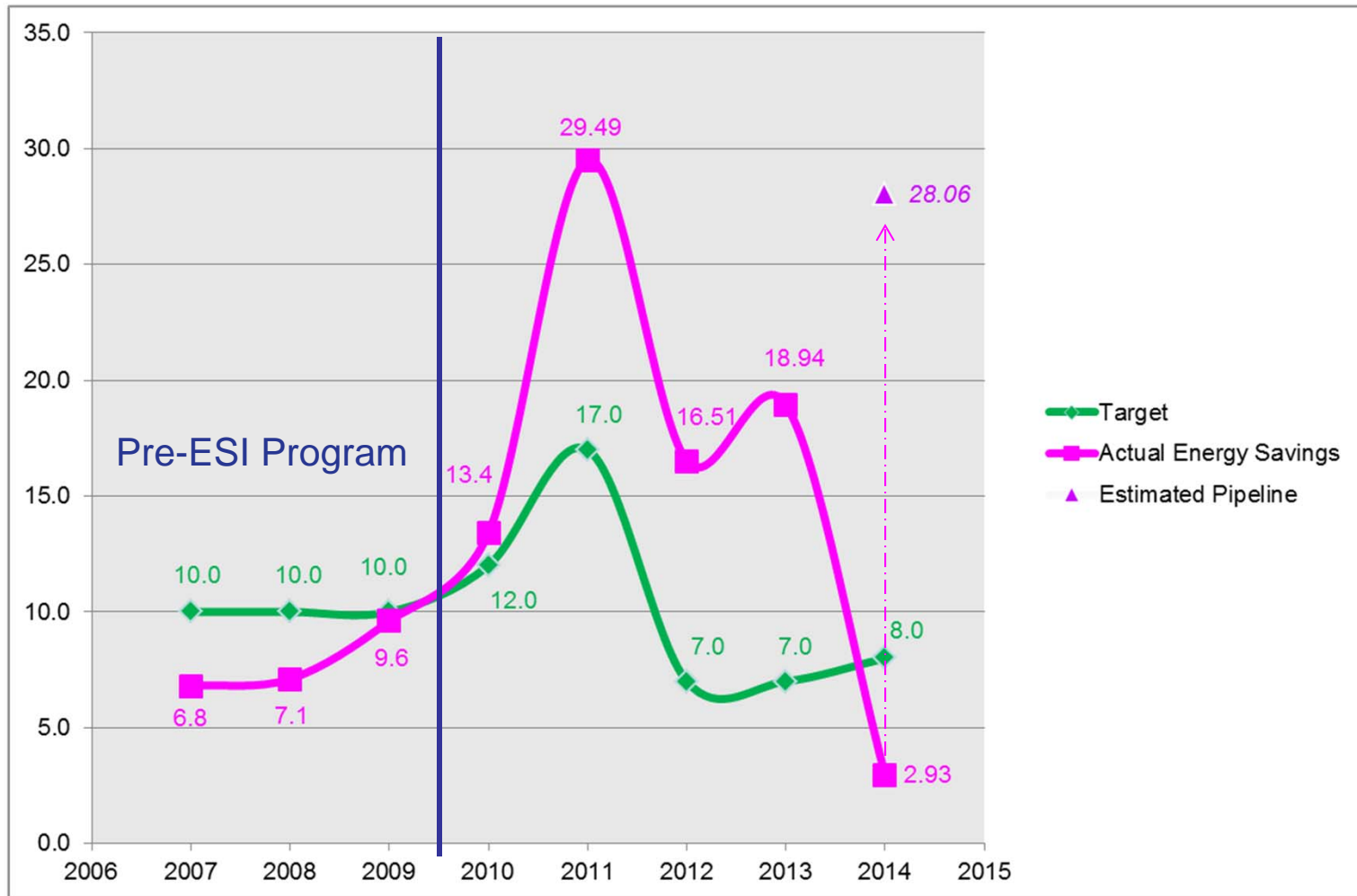
Energy Smart Industrial (ESI) Program Components



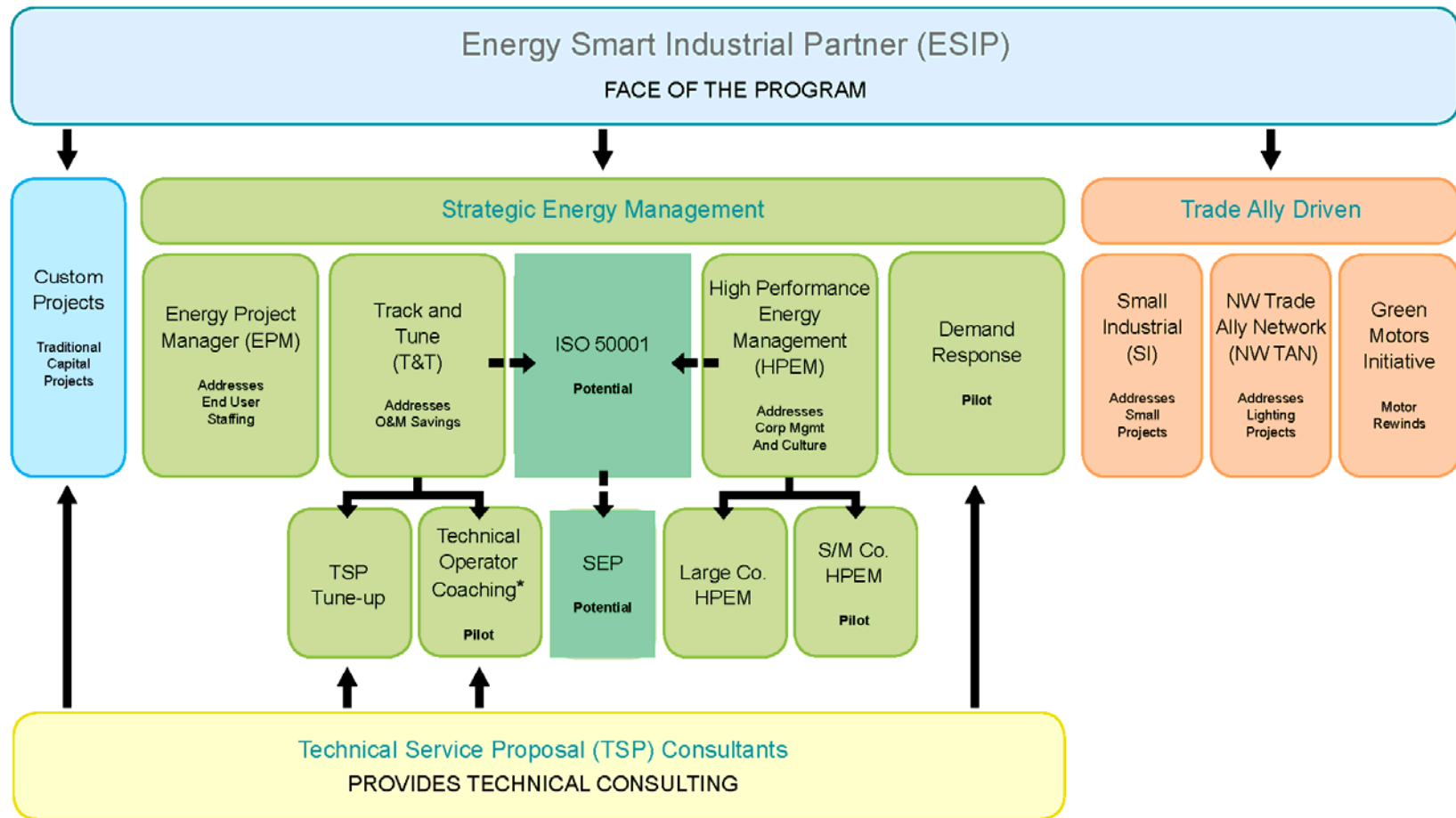
ESI Program Overview

- Program statistics from Oct 2009 to Apr 2014:
 - 109 participating utilities (represents 99% of BPA industrial load and includes the Top 20 utilities).
 - Industrial end user engagements: over 600 to-date
 - Acquired over 80 aMW to-date (or 709,560,000 kWh)
 - Significant presence in all industrial sectors:
 - Pulp & Paper and Wood Products
 - Food Processing and Cold Storage
 - Water and Wastewater
 - Chemical

Energy Targets & Savings



ESI Program Components, Today

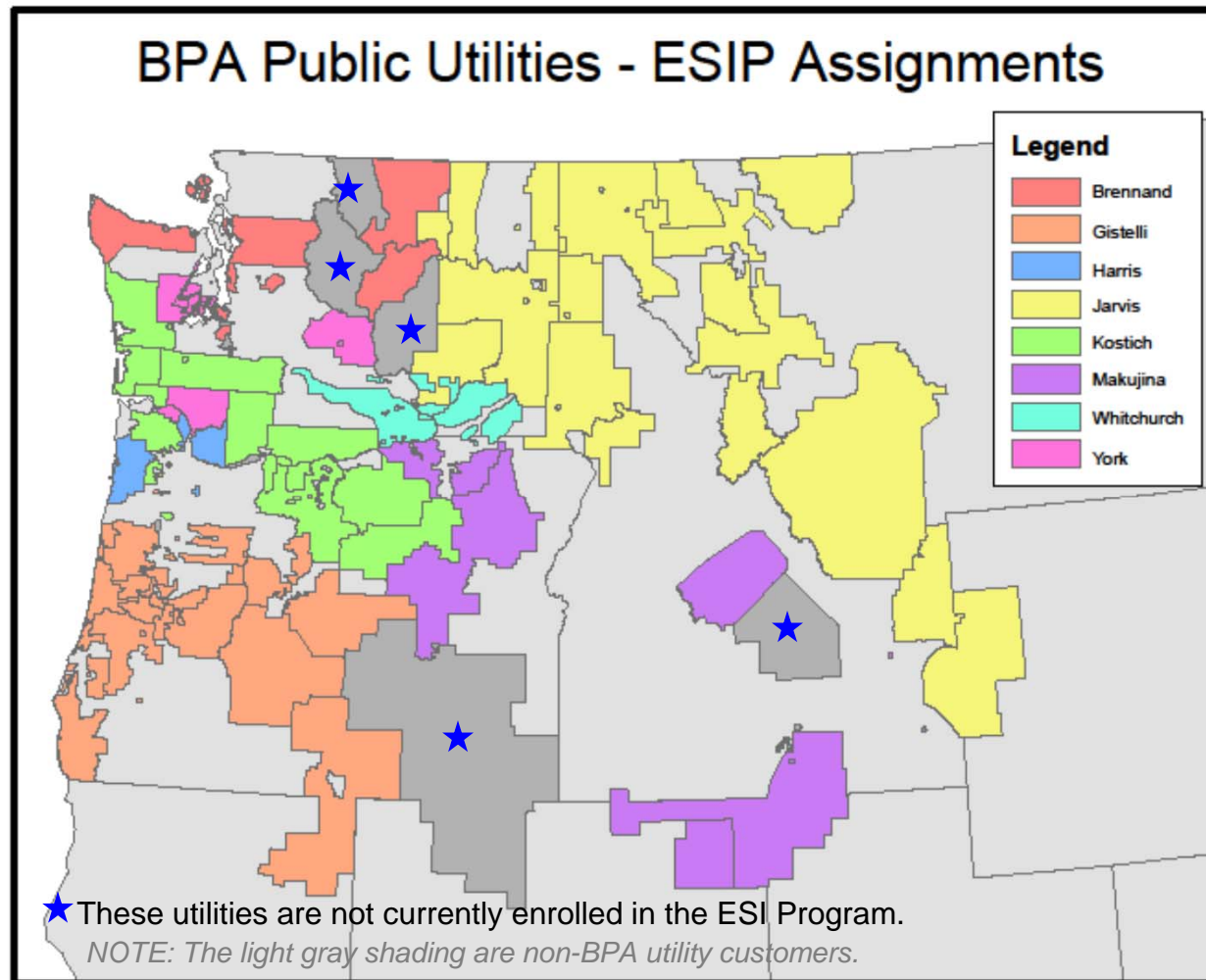


*e.g. Refrigeration Operator Coaching (ROC)

ESI: Relationships, Key to Success

- Energy Smart Industrial Partner → “ESIP”
 - Single point-of-contact for utility/end user; program/project marketing, sales, and management for **everything industrial**
 - Identify, analyze, and justify costs; and facilitate, develop, track and close-out projects
 - BPA, end user, and utility relationship management
 - Develops utility/end user communication and action plans
 - Industrial highly technical (engineers often required)

ESIP – Face of the Program



Energy Project Manager (EPM)

- Industries that are manpower-constrained may qualify for ESI's Energy Project Manager co-funding.
 - Commit to an electrical energy savings goal of at least 1,000,000 kWh.
 - Commit to allocating sufficient capital to support energy projects that meet your savings goals.
 - Commit dedicated staff resources to support energy-related project workload.

EPM Accomplishments²

- As of March 2014, executed 13 EPM agreements for 15 EPMs in 23 industrial facilities.

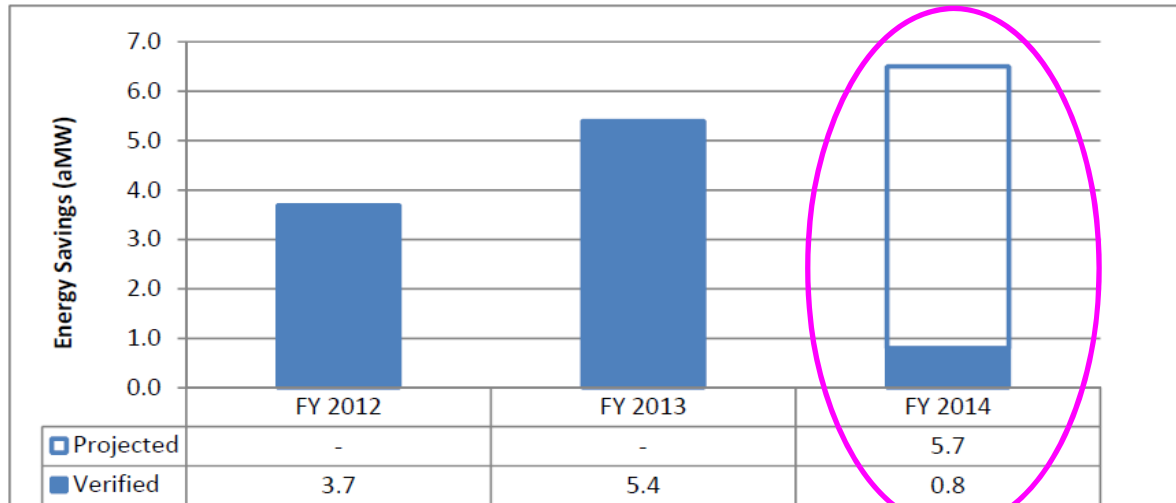


Figure 1. EPM Savings Forecast

²EPMs program-to-date: 31 EPMs in 36 different facilities; managing over 30 aMW of various types of projects.

Track and Tune (T&T)

- Focus on operations and maintenance (O&M) savings – e.g., low-cost / no-cost solutions.
 - Little-to-no capital investment required to achieve cost savings
 - Immediate achievement of energy cost savings when tune-up actions are implemented.
 - Schedule a tune-up event (multi-day facility review targeting O&M efforts) and develop an action item list.
 - Co-funded technical resources support tune-up events and action item implementation.
 - Incentives may be available for facilities that sustain and improve efficiency.

T&T Accomplishments

- As of March 2014, executed 18 T&T agreements in 20 facilities, with BPA verified (booked savings) 2.36 aMW (or over 20,661,500 kWhs).
 - The FY2014/2015 estimated pipeline energy savings is 1.31 aMW (or 11,500,000 kWhs).
- Applied to a wide range of industrial systems
 - Ammonia refrigeration
 - Compressed air (pulp and paper)
 - Fans (malt processing)
 - Pumping (municipal water)
 - HVAC (high tech cleanroom)
 - Pumping (pulp and paper)

Refrigerator Operator Coaching (ROC)

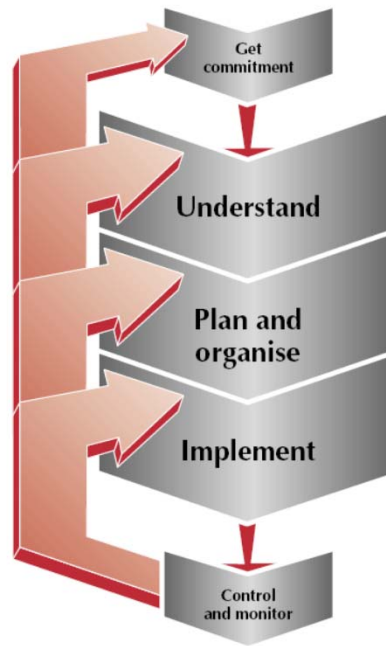
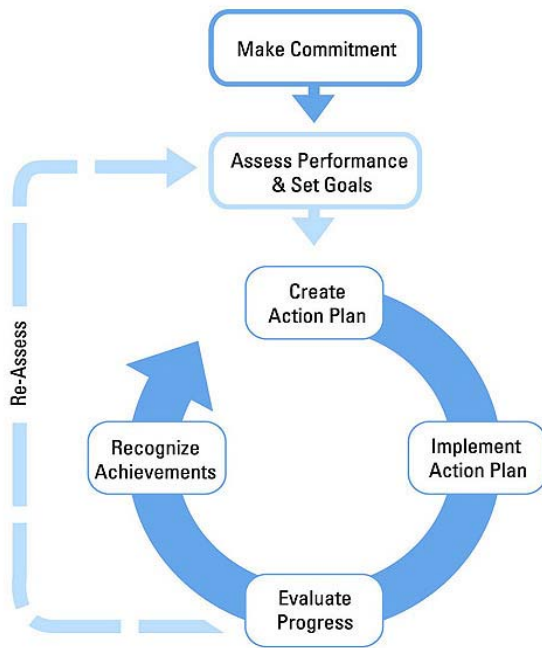
- ROC is a cohort-based approach to T&T
 - Targeted at facilities with large refrigeration load.
 - Purpose: train refrigeration operators to increase the efficiency of their systems using low-cost / no-cost O&M efforts.
- As of March 2014, seven industrial facilities within four utility service territories are participating
 - Potential energy savings is 0.32 aMW (or nearly 2,807,000 kWh).

High Performance Energy Management (HPEM)

- Targets sustainable practices (behavior-based) in entire plant
- Structured network groups or one-on-one
- Creates a long-term vision for the facility with short-term actions to control and reduce energy costs.
- Incentives for annual measured and verified (M&V) energy savings over a 3 or 5 year duration.

HPEM - Continuous Improvement

3 ways to visualize



Continuous Energy Improvement
A Strategic Process for Industry



HPEM Accomplishments

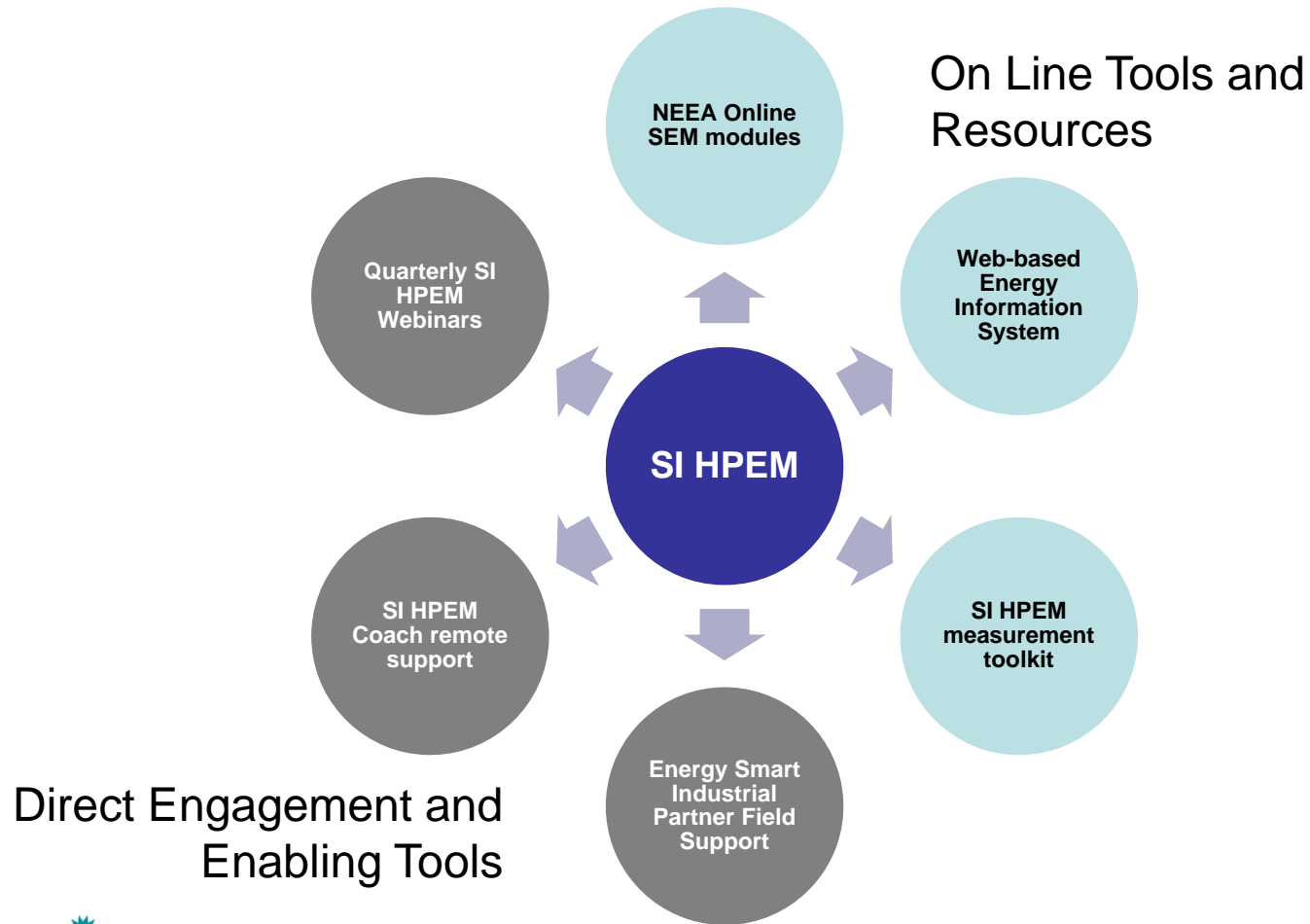
- As of March 2014, ESI has launched four HPEM cohorts and one single-site.

Cohort Name/Area	# Facilities	# Utilities	aMW Savings	Accumulated kWh Savings	Participation Year
Southwest Washington Area	13	5	1.10	9,655,034	Started Yr-4
Puget Sound Area	11	2	0.84	7,345,658	Started Yr-3
Georgia Pacific	6	2	0.21	1,839,720	Started Yr-2
Simplot Ag (phosphate mine)	1	1	0.13	1,213,229	Started Yr-4
Lower Columbia Area	8	3	Estimated 1.79	Estimated 15,705,594	Started Yr-1
Totals	39	13	2.29 (4.1 w/est.)	20,759,235 (35,759,235 w/est.)	

Small Industrial HPEM

- The Small Industrial HPEM pilot is focused on qualifying industries with limited staff resources, and the training program is efficient with a flexible schedule designed to meet their needs.
 - How does it work?
 - ESIPs work with a variety of industries
 - Bringing their knowledge and experience and coaching
 - Provides resources to ensure success.
 - Three phases: enrollment, engagement and persistence.

Leverage Resources



Incentives, How Paid?

- EPM co-funding: Funding is based on the *lesser of*
 - a. \$0.025/kWh of actual verified busbar energy savings
 - b. The total annual cost of the EPM as described in the EPM Comprehensive Plan, or
 - c. \$250,000 (or utility-established NTE cap)

Incentives, continued

- T&T Projects: T&T participants are eligible for the following categories:
 - Performance Tracking Systems³ (PTS) installation co-funding - - up to \$0.0025/kWh annual consumption
 - Action Item co-funding - - the lesser of \$0.075/kWh savings, or 70% of documented implementation costs
 - Annual Sustained Savings Incentive co-funding - - \$0.025/kWh of verified savings

³PTS cost cap can be set by utility: allowable expenses up to \$10,000 for system baseline of 4,000,000 kWh or less, capped at \$50,000 for system baseline of 20,000,000 kWh or greater

Incentives, continued

- HPEM: Depends on selected performance period length (e.g., 3 year period or 5 year period)
 - Years 1-3 or 1-5: \$0.025/kWh of BPA verified MT&R energy savings for the previous 12 months. Payments are made at the conclusion of each year based upon the reported savings in the HPEM Completion Report.
 - A utility may choose to apply a funding cap to manage their budget allocations and create more flexibility, etc.
 - BPA assigns a 6-yr measure life (ML) for the savings reported at conclusion of the 5th year; whereas, there is the implicit assumption the management system is mature and will support persistence of savings.

ESI an Evaluated Program

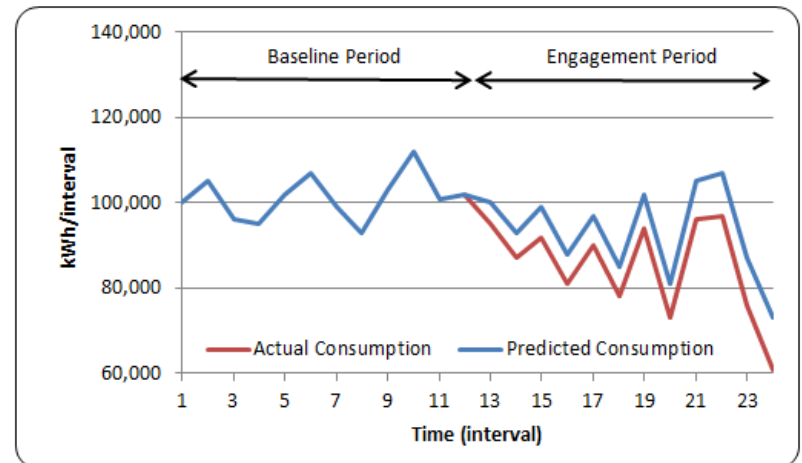
- Process Evaluation Completed
 - High marks from utilities and end users for technical and service elements
- Initial Impact Evaluation Completed
 - Energy Management pilot component focus
 - High marks for savings realization rate (88%) and methods
- Preparing 2014 follow-up Impact Evaluation to ensure persistence of savings.

Measurement & Verification

- Top-down predictive modeling approach
 - Distinguishes influence of Strategic Energy Management (SEM) effort from effect of other variables
 - Independent variable selection is critical
 - Incented capital projects require consistent treatment
 - Daily interval preferred (beware of tradeoffs - e.g. autocorrelation)
- MT&R Reference Guide v4.0
 - Provides a consistent framework for establishing baseline models and reporting savings from SEM engagements.
- First evaluation shows 2.7% of behavior-based and O&M savings for first year, plus 1.6% capital project savings.

Monitoring, Targeting and Reporting (MT&R)

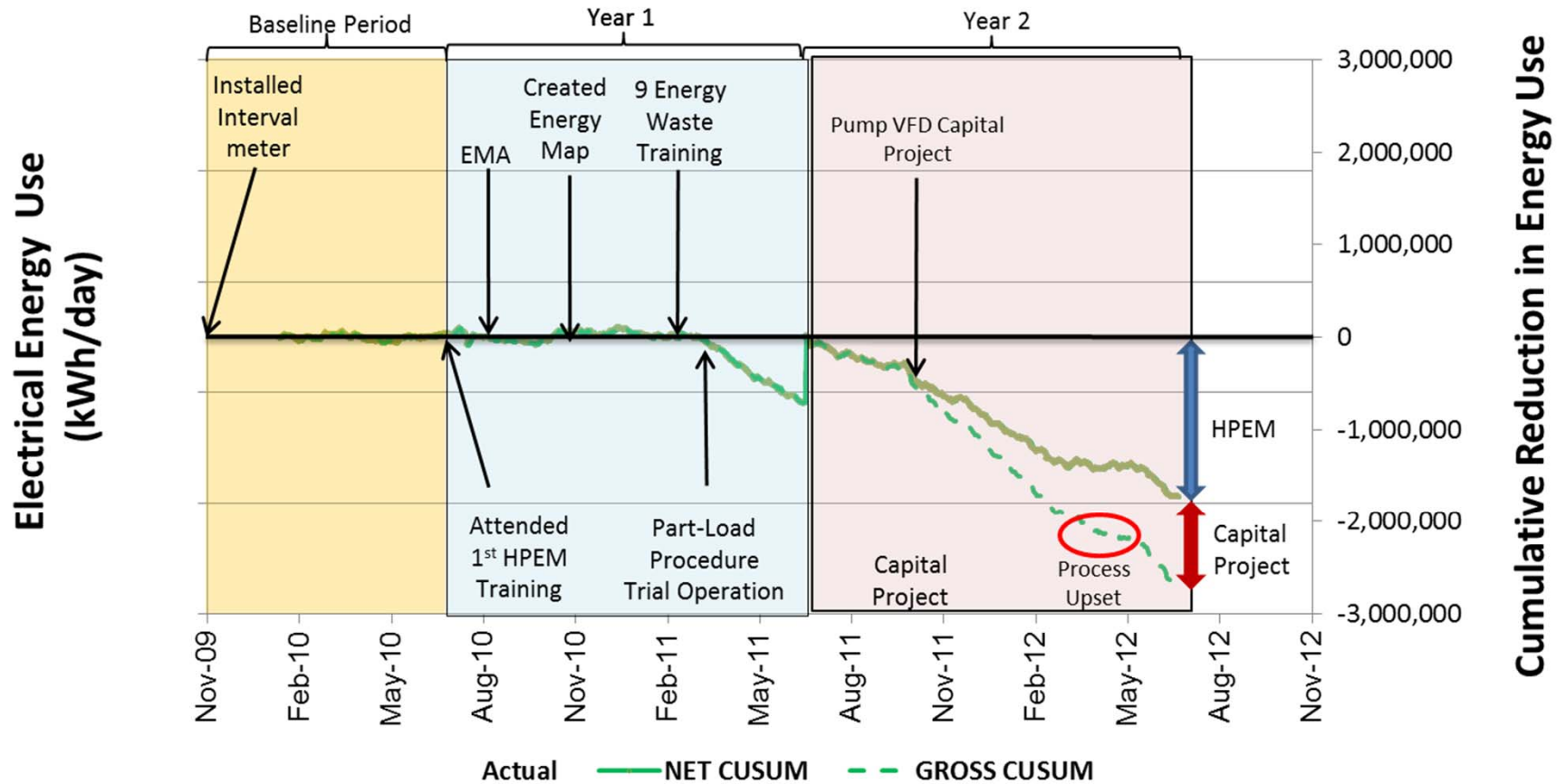
- MT&R⁴ is an energy efficiency modeling, accounting and control technique
- Applied to HPEM, whole-facility T&T, and sub-system T&T
 - During baseline and sustained savings periods



⁴The MT&R Reference Guide v4.0 is available:

http://www.bpa.gov/Energy/N/pdf/MTR_Reference_Guide_Rev4_0.pdf

Applied MT&R – HPEM Participant



Other Lessons Learned

- Have a dedicated project tracking tool (i.e., ESI TrakSmart)
- Flexibility with program adjustments
- Enforced customer service standards and corrective action reports
- SEM-based resource acquisition is a multi-year proposition
 - Organizations integrate SEM at various rates: most take 3-5 years to develop a mature system
- Dedicated engineer/relationship position - not just about the technical – it's also about relationship

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http://www.bpa.gov/energy/n/industrial/program_materials.cfm