Cascade**Energy**

Overview of Strategic Energy Management Cohorts

This resource offers basic information on SEM cohort design including what is a cohort, key characteristics of cohorts, funding, process and a sample schedule etc. It also looks at the use of energy management information systems (EMIS) in cohorts, conducting a Kaizen or energy scan and setting up a maintenance process once the cohort is over.

An Informal Overview of SEM Cohorts

Draft

Strategic Energy Management (SEM) cohorts are a highly efficiency means of delivering cost-effective training and guidance to industrial customers. Cohorts leverage peer interaction to drive greater organizational change and volume of projects. By contrast, individual SEM is suited for geographically isolated facilities, those that have competitive sensitivities, or that require a higher degree of one-on-one coaching.

Cohort SEM

Advantages	Disadvantages
Workshop training costs are spread over many customers	Geographically constrained
Peer-driven accountability	Batch process limits scalability
Peer exchange of best practices	Rare competitive sensitivities
Friendly competition	
Spreads out risk of poor energy savings (portfolio affect)	
Dedicated off-site development time for customers	
Option to involve utility and customer stakeholders	
Builds SEM peer community	
Makes SEM implementation manageable for large industrial customers (e.g. multi-department cohort at a large site or multiple corporate locations)	

Individual SEM

Advantages	Disadvantages
More one-on-one coaching	Often more costly on per site basis
No competitive sensitivities	No peer-driven benefits
Serves geographically isolated companies	
More scalable in a short amount of time than cohorts	

1 WHAT IS A COHORT

The cohort design is a proven delivery model for Strategic Energy Management (SEM). It consists of 6-12 non-competitive industrial customers in close geographic proximity. Customers attend six training workshops that instill the principles of energy management, technical assessment, organizational change, and employee engagement. The process builds long term relationships; increases traditional program awareness; and expedites the discovery, implementation, and documentation of savings opportunities in both operations and capital projects.

At its heart is peer-centered learning. Customers share in their challenges and success, and in the process develop a support network that encourages perseverance, accountability, and friendly competition. This increases the likelihood of SEM implementation and observable savings, while reducing the need for extensive one-on-one coaching.

Successful SEM cohort program designs are those with solid foundations in organizational change management and continuous improvement principles. They incorporate a process of executive commitment, metrics building, quick-win facilitation, communication planning, and employee engagement. Furthermore, these principles must be couched in the continuous improvement language with which they are familiar.

Services and tools are provided to reduce barriers and compress the development timeline. For example, the energy management assessment should be one of the first tasks. It builds SEM awareness, creates a sense of urgency and starts the process of establishing buy-in and commitment. Likewise, the identification of energy savings opportunities and the development of an EM&T model should be completed prior to the first workshop to enable appreciable energy savings at the start of the process when strong commitment is needed most.

From the onset of recruiting through the scoping assessment and the entirety of the program, the SEM coaches and engineers must exhibit a high degree of technical proficiency. The recommended changes require that participants take small incremental risks. Trust stems from SEM coaches' a deep understanding of participants industries and their end-use systems. Once trust in technical proficiency is established, incremental steps toward optimization are possible.

The workshops should target the development of the energy teams and their executive sponsors. The topics should range from technical opportunity discovery to employee engagement and organizational change management. Regardless of the topic, all workshops should facilitate a shared experience and expectations of progress. In some cases, the inclusion of stakeholders (e.g. regulators, engineering design firms, supply chain customers, etc.) reduces the perceived risk of incrementally optimizing systems and processes.

1.1 KEY CHARACTERISTICS OF COHORTS

- Between 6 and 12 customers geographically clustered within 1-2 hour drive
- Loads range from 8 – 90 GWh/yr*. Larger plants are often broken into departmental cohorts.
- Customers without competitive concerns. We have found this issue to be fairly rare.
- Energy Management Assessments (two each: one at start, and one at end of the first year)
- Series of 6 workshops spanning ~1 year
- Employee-centered energy opportunity discovery event (e.g. kaizen, energy scan) for each customer
- EM&T (including an energy model and a common EMIS for the cohort)
- Measurement toolkit sometimes provided (e.g. Hobo data loggers)
- Performance incentives usually provided. See incentives comparison below. Savings persistence and access are generally improved with incentives.
- Token milestone incentives sometimes provided for completing critical activities (e.g. providing production data)

*Note, SEM cohorts are being offered to smaller facilities as well. Some design features include scaling up the number of participants as with Energy Trust's offering, or remote learning and webinars in the case of Bonneville Power Association's offering.

1.2 COHORT FUNDING

Cohort funding tends to cover most of the direct costs to the participant in order to lower the recruiting barrier, and acknowledging that participants must invest significant time and focus in order for SEM to be successful. In addition, energy savings actions (no-cost and low-cost changes) are incented, typically based on the savings measured by the top-down regression model.

Incentives Comparison

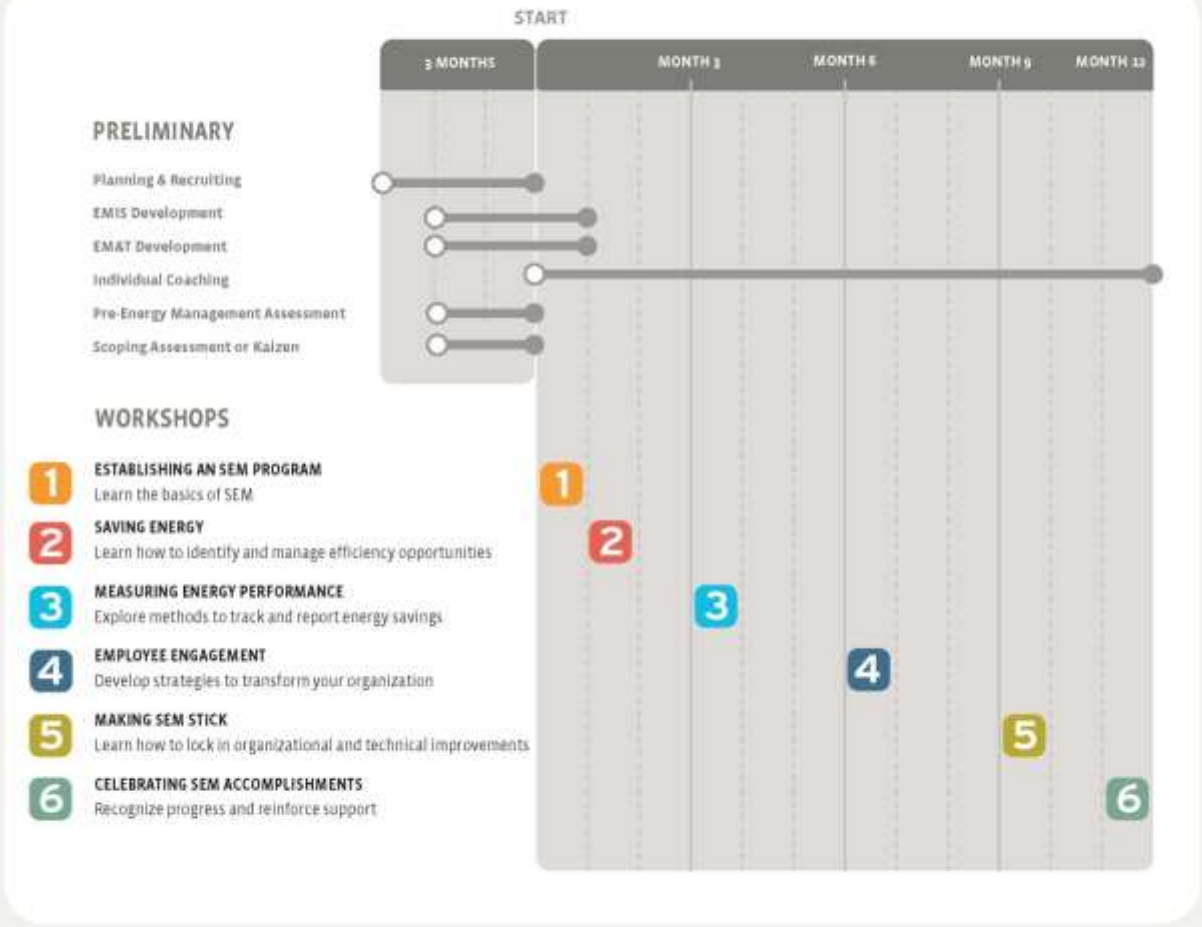
Utility	Performance Incentive
Energy Trust of Oregon	$0.02/kWh; $.40/Therm (IEI, CSEM, ROC) $0.01/kWh; $.20/Therm (IEI Maintenance)
Bonneville Power Administration	$0.025/kWh per year for five years
Efficiency Vermont	*none*
Idaho Power	$0.20/kWh reimbursable costs
PacifiCorp	$0.02/kWh
Chelan County PUD	*none*
Puget Sound Energy	$0.05/kWh up to 70% of the project cost.

Most programs provide the SEM delivery and the energy model (and model maintenance) in their SEM engagements. Many provide full or partial funding for an EMIS to support the SEM engagement. Some programs provide a pre-selected EMIS, and some allow end-customers to select the EMIS.

Services & EMIS

Utility	SEM Delivery	Energy Model	EMIS
Energy Trust of Oregon	Provided	Provided	Provided for two years in certain cohorts
Bonneville Power Administration	Provided	Provided	Provided for certain cohorts. Up to $50K for Track & Tune projects
Efficiency Vermont	Provided	Provided	Co-funded for two years
Idaho Power	Provided	Provided	Provided for two years
PacifiCorp	Provided	Provided	Mix of program-funded and customer self-funded
Chelan County PUD	Provided	Provided	Provided for two years
Puget Sound Energy	Provided	Provided	Co-funded for one year, at up to 70%.

PROGRAM SCHEDULE



1.3 COHORT PROCESS

1. Preparation
    a. Recruiting & Planning
    b. EMA for executive awareness, buy-in, urgency, and informed coaching strategies
    c. Identify quick savings opportunities through kaizen, scoping assessment, or tune-up
    d. Set up the shared EMIS, get data flowing, and build the energy models
2. 6-8 workshops
    a. Have a practical balance of technical and organizational development
    b. Be high on collaboration and work products
    c. Be low on lecture and PowerPoint
    d. Drive accountability
3. On-site coaching
    a. Work through unique problems
    b. Build relationships
    c. Drive accountability
4. Remote coaching
    a. Regular check-in calls set development cadence
    b. Drive accountability
    c. EMIS monitoring to drive timely completion of action items and stop backsliding
5. EM&V
    a. Energy model, and model maintenance
    b. Energy tracking, analysis and reporting toolkit
    c. Action item & project tracking
6. Cohort Reporting
    a. Meticulous documentation for bullet proof completion reports
    b. Easy (dashboard) monitoring by program administrators
7. Stakeholder engagement
    a. Active outreach to utility stakeholders (e.g. regulators invited to Report Out workshop)
    b. Active outreach to participant stakeholders (e.g. supply chain buyers/customers, regulators, etc.)

2 EMIS IN COHORTS

The use of Energy Management Information Systems in cohorts is beneficial for a number of reasons. Efficiency Vermont, Idaho Power, Bonneville Power, and Energy Trust have integrated EMIS because:

- It facilitates targeted coaching (e.g. backsliding prevention, task management)
- Users are able to easily produce and disseminate reports to advocate for the program internally
- It is used to clearly highlight inflections in the savings profile, and to link those inflections to actions and projects being completed at the site. Downward savings inflections are clearly revealed, encouraging participants and coaches to work uncover and address the root cause before too much time has passed
- Users tend to focus more on finding and implementing energy savings measures, rather than on data collection, manual model updating and manual savings tracking
- It enhances the documentation of activities and projects, leaving more time for the SEM coach and energy champion to focus on learning and project implementation
- It gives the program administrators the ability to track progress in real time
- It reduces the programmatic effort required to manage multiple cohorts and multi-year SEM maintenance efforts
- It is used to flag capital projects as they are identified for service by other programs and account managers

3 KAIZENS (ENERGY SCANS)

Kaizens are one part opportunity discovery and one part employee engagement. Their first objective is to prime the pump with opportunities than can be implemented within 90 days. The second objective is to train the participants in the kaizen process so they can replicate it again and again. Lastly, empower employees as the drivers of the opportunities. Below is a typical agenda:

Day 1:

1. Meeting with plant manager to set expectations and event goal
2. SEM Coach and engineer scour the plant for opportunity leads

Day 2:

1. Other cohort participants arrive
2. Representative cross-section of plant staff arrive
3. Plant manager opens up the event with words on importance of energy, their annual goal, and the event goal
4. Plant operations, maintenance, or engineering representative gives overview of plant and loads
5. Nine energy wastes training
6. Plant tour
7. Brainstorming event (see Value Map below)

8. Break into groups and vet/prioritize opportunities in the plant. SEM subtlety lead participants to opportunities – they've got to find them for themselves to take ownership.
9. Time permitting: estimate ROM savings estimates.
10. Report out to plant manager
11. Plant manager & SEM staff close

Bigger plants can utilize more engineers and/or 3-4 days

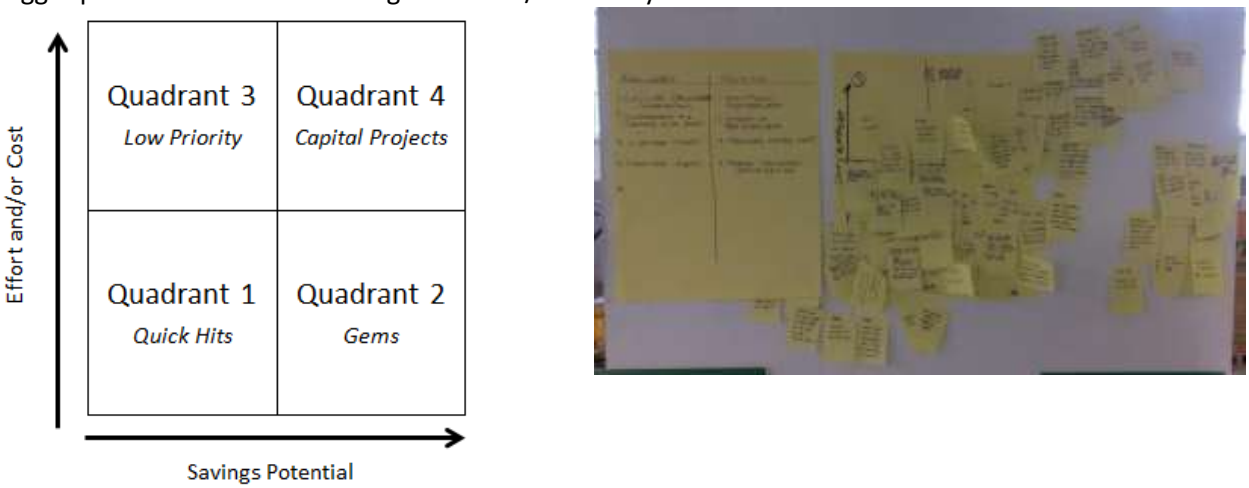


Figure 1: Brainstorming Value Map w/ Real World Example

4 COHORT MAINTENANCE

Maintenance is increasingly standard with the Energy Trust of Oregon and Bonneville Power Administration. Energy Trust is moving to a continuous model following the intensive cohort year, whereas Bonneville does 4 years of maintenance.

4.1 BENEFITS OF MAINTENANCE

- After the first year, participants' energy management programs are fragile. Ongoing coaching fills gaps and keeps it from falling apart.
- Backsliding is common without active encouragement and support.
- Continuity of relationships builds trust with program and utility
- Best time to harvest increased capital projects are in later years

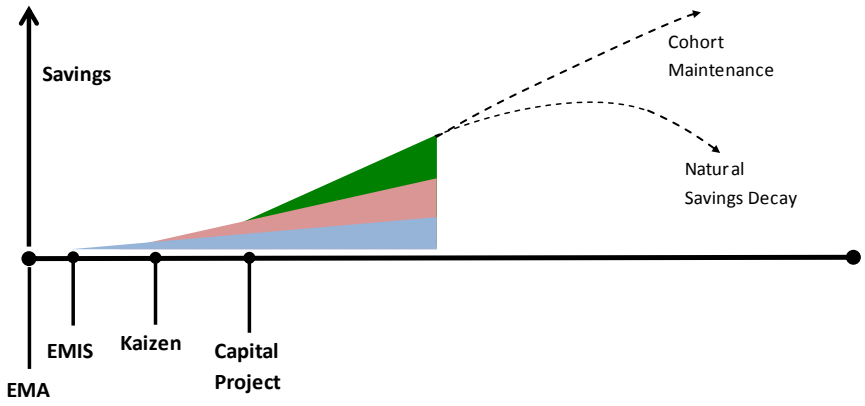


Figure 2: Importance of Cohort Maintenance

4.2 MAINTENANCE PROCESS

Maintenance is ongoing program support to ensure that customers' programs mature and endure. Inevitably disruptions in customer SEM programs occur. These can include the departure of an energy champion or sponsor, major expansions or layoffs, and the ever present threat of competing priorities. Maintenance support seeks to mitigate the impact of these disruptions.

Maintenance is provided in a number ways that often include:

- Regular check-in calls
- Semiannual workshops
- Remote EMIS performance monitoring
- Recurring EMAs
- Recurring kaizens
- Onsite coaching (e.g. temporarily chairing energy team meetings, employee engagement, etc.)
- Executive engagement (e.g. strategic planning, public recognition, etc.)

4.3 MITIGATING DATA PRIVACY CONCERNS

The following approaches have been successful in mitigating most data privacy and competitive concerns that have come up:

- Program and provider track record, and trusting relationships with client base
- Data masking
- NDAs
- Procedural and design safeguards
- Minimization of email transfer of sensitive data