

A Tale of Two CEIs

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ABSTRACT

It is becoming increasingly common for energy efficiency programs to encourage the installation of energy management systems with their largest customers. These programs, commonly called Strategic Energy Management (SEM) or Continuous Energy Improvement (CEI), frequently use a “cohort” model for implementing them. A statewide energy efficiency utility, Efficiency Vermont, designed its CEI program with “plan-do-check-act” principles that were already familiar to facility managers. But what did the cohort design need to look like? How do we coordinate several companies at once, to ensure productive, peer-to-peer sharing experience while capitalizing on the benefits of training multiple companies? Achieving economies of scale for generating energy savings (a key benefit for the efficiency program) was a significant objective in driving the cohort design. With two cohorts completed and third under way, Efficiency Vermont designed the first to involve many large, well-engaged energy users, predominantly from the manufacturing sector, but also one ski area, university, and hospital. The common denominators were company size and high-use characteristics; end uses and end products were all different. Cohort 2’s design involved a single process, ammonia refrigeration, common to essentially one Vermont industry with many players: the dairy industry. All businesses were relatively large, and all processes were similar; only the end product was slightly different. This paper discusses the similarities and differences of the engagement and savings opportunities, peer-to-peer dialog, and support for each cohort, in the first year of implementation. This paper also presents the strategy behind the selection of companies in the third cohort.

Background

Efficiency Vermont’s approach to helping the state’s largest energy users save energy is based on account management principles. Key account managers have been assigned to nearly all of Vermont’s largest industrial customers, and technical energy consultants work in tandem to complement the account managers’ engagement with each customer. In 2013, Efficiency Vermont was in the process of sunseting a very successful 2-year initiative that challenged their largest account-managed customers to save 7.5 percent of their energy use. Customers saw a high value in the peer exchanges that had occurred during that initiative, and in their in-depth engagement from Efficiency Vermont—and wondered what was next.

Account managers and technical staff had been reading papers written by the Northwest Energy Efficiency Alliance (NEEA) about SEM programs, and attended the 2013 ACEEE Energy Efficiency in Industry Conference. Further, the staff had learned about the success that the Energy Trust of Oregon and the Bonneville Power Authority had been achieving through their SEM programs. These influences prompted the Efficiency Vermont staff to agree that engaging customers in SEM was the answer to the “What’s next?” question.

Efficiency Vermont staff made the decision to offer the value that a SEM program could provide to its large commercial and industrial market (C&I) customer base. Although the

efficiency utility and its regulators saw value in the SEM approach, Efficiency Vermont staff proceeded with deliberation by launching a pilot project, funded through a regulator-sanctioned internal research-and-development budget line item. The set-aside funding supports projects that are separate from regular programs, as a way of informing future program design. In this case, the staff wanted to capture, quantify, and evaluate behavioral savings from an SEM effort, even though they would not be able to include them in the annual savings claims to regulators. Efficiency Vermont chose the term *CEI* to convey to regulators and customers the ongoing character of continuous energy improvement. The CEI program's short term goals are to introduce holistic energy management strategies to our customers utilizing employee engagement approaches to identify and implement low/no cost opportunities. The long term vision of this program is show the value of managing energy as a core business strategy and strengthen each company's resource structure for ongoing management.

Looking Back: Cohort 1 Experience and Results

Staff reached out to targeted customers and recruited them for the first cohort. This cohort comprised 8 customers, from the pool of the state's largest energy users that were most engaged in energy efficiency practices. Five of the customers were manufacturers; the other three were a ski area, a hospital, and a university. In the first few months, the university withdrew its participation because it lacked the labor resources needed to support the effort. Efficiency Vermont continued the pilot, using guidelines ("minimal elements") from the Consortium for Energy Efficiency (CEE) for customer commitment, efforts toward energy planning, and systems for measuring and reporting, using facility-specific energy data.

The team created a memorandum of understanding between Efficiency Vermont and each customer, with the protocols shown in this box:

Efficiency Vermont CEI Memorandum of Understanding (MOU)

Expectations of Customers

1. Prioritize energy management, and:
 - Assign a corporate sponsor
 - Create an energy team responsible for maintaining visibility and metrics
 - Communicate goals and priorities to staff
 - Promote energy awareness among employees
2. Establish energy management processes and plans for:
 - Assessing energy management practices toward continued improvement
 - Setting goals with annual performance reviews and updates
 - Identifying additional opportunities for an annual implementation plan
3. Collect and track energy performance with respect to goals and metrics
 - Measure key factors that influence energy use
 - Collect data and providing it to Efficiency Vermont
 - Analyze data to support effective decision-making

The customers became active participants in the workshops that followed. The activity involved a kick-off orientation meeting, and a data analytics and reporting workshop, followed by an employee engagement workshop; each of these occurred in the first year. Efficiency Vermont sited these workshops in different locations throughout the state, to minimize the travel requirements of some of the businesses.

Efficiency Vermont also designed the workshops to be peer networking opportunities, which contributed to high-quality discussions ranging from common equipment issues to typical resource constraints within each business. After one of the workshops, a participant commented: “I never realized how much making snow was like molding plastic.”

This comment illustrated the fact that, no matter what the product, the internal processes around staffing, the challenges related to managing staff effectively, and effectively managing equipment use are essentially the same. Further, Efficiency Vermont staff received some interesting, critical feedback from the post-workshop confidential surveys they sent to the participants. The central observation was that the workshops’ material was too broad, and was not easy to put into action, once the customers’ staff were back at their facilities in the weeks and months after a workshop. Table 1 shows the sequence of Cohort 1’s process.

Table 1. Process involved in engaging the customers in the first cohort of the CEI pilot

Cohort 1 engagement plan in Year 1
Enroll with MOU
Kick-off meeting and workshop
Energy assessment and plan development
Workshop on energy use tracking tool
Monthly energy efficiency progress meetings
Employee engagement workshop
Employee engagement action plan
Goal achievement report

In Year 2 of Cohort 1, staff designed workshops to re-establish each facility’s commitment and offer more tactical approaches to much of the information learned in Year 1. Year 2’s design drew on the feedback received from the initial round of the workshop.

For example, participants learned new, more tactical approaches to employee engagement with a goal of delivering strategies that could be implemented quickly after the workshop. In addition, Efficiency Vermont added one more manufacturing customer to the group in Year 2.

Adding a participant to the cohort is not typical. Vermont has a small number of large manufacturers that are ready for the rigor of CEI engagement. In this case, the new addition to the cohort was willing to make a commitment, in time for the start of Year 2. The existing peer group welcomed the addition of this company. This rounded out the final group to 6 manufacturers, 1 ski area, and 1 hospital. Table 2 presents the engagement plan for Year 2.

Table 2. Process involved in maintaining the engagement of Cohort 1 in Year 2

Cohort 1 engagement plan in Year 2
Commitment workshop
Tactical employee engagement workshop
Goal achievement report

At the end of Year 2, Efficiency Vermont evaluated the program for customer satisfaction, customer value, and attributed savings. After several interviews and surveys, the evaluators determined that the program provided benefits of high value generally, with peer-to-peer engagement bringing the highest value. “Value” for large manufacturing customers is typically measured in terms of an initiative’s contribution to the system benefits charge on their utility bills. In addition, the program staff’s documentation and data tool review indicated that the pilot had successfully employed the CEE minimum elements, and that Efficiency Vermont was on a strong course for working with customers toward future, broader energy management strategies.

As with planning and evaluation of many other SEM programs, the Vermont program uses regression analysis in its initial project planning and savings estimation. Staff deemed the CEI program as not cost effective, in the context of a 1-year measure life for behavioral savings. However, staff could deem Cohort 1’s performance as cost effective at a measure life of 3 years. As a result, Vermont’s regulators kept the program under the pilot framework for further evaluation. Table 3 presents the energy savings from Cohort 1.

Table 3. Pilot program results from Cohort 1, in terms of evaluated energy savings

Savings categories	Evaluated savings, MWh / year
Evaluated capital project savings	868.6
Evaluated CEI savings	1,009.2
Total evaluated facility savings	1,877.8
Average savings per facility	3%

Evaluation Conclusions

- The project engaged participants in implementing minimum CEI elements, resulting in greater energy efficiency awareness within each business
- Some participants found the project required too much time for workshop attendance
- Participants found it difficult to find sufficient time for energy team activities
- High satisfaction with peer-to-peer interaction and support from Efficiency Vermont
- It was very challenging to maintain ongoing employee engagement
- Participants are already invested in corporate sustainability efforts

Here and Now: Cohort 2 Experience & Results

After Year 1 of Cohort 1, and even before the energy efficiency utility's third-party program evaluation, Efficiency Vermont decided to assemble a second cohort within the CEI pilot. Staff used the following lessons from Cohort 1 to plan Cohort 2:

1. Workshop material was too broad, and it was difficult to put into action upon returning to the customer's facility.
2. The opportunity for peer-to-peer engagement brought the highest value.
3. Savings must persist for at least three years for the program to be cost effective.
4. Ongoing employee engagement is challenging to maintain.

Specifically, Cohort 2 addressed a common technology present at each customer site; staff made trainings and workshop activities more technical and action oriented; and customers used a smaller subsection of employees for the process. Cohort 2 began in 2015, still under the pilot status, and Efficiency Vermont instituted program modifications to improve its performance and cost effectiveness. One change was the transition from an initial emphasis by participants on broad efforts in employee engagement (the "softer" side of energy management) to a narrower technical emphasis for cohort engagement. This approach addressed the first lesson about the workshop material.

Cohort 2 addressed the third lesson (persistence of savings) by targeting large industrial customers with a common technology that accounts for a large percentage of their energy consumption, ammonia refrigeration. In Vermont, the businesses using this technology are by and large all within the dairy industry. The six facilities Efficiency Vermont recruited have similar processes, but their final products are all different. This style of recruitment confirmed Efficiency Vermont's hypothesis that this strategy provided greater opportunities for company-to-company sharing of information. The strategy maintained the benefits from the second lesson, regarding peer-to-peer exchanges.

As with Cohort 1, the peer-to-peer exchange began with a kick-off meeting and workshop that explained the CEI process and how its technical characteristics fit into the overall strategy of the program. Following the introductory workshop, Efficiency Vermont staff offered deep-dive technical sessions, to allow increased learning and exchange on operations and maintenance changes customers could make to the ammonia systems, to increase equipment efficiency. Each facility first filled out a technology-specific scorecard to level-set any future improvements. The subsequent sessions comprised a best-practice training workshop, and onsite system assessments of each facility. One of these offered the chance for other facilities to visit and see the assessments firsthand. In this case, the peer-to-peer dialog and information sharing were tactical and practical, and offered company personnel to return to their respective facilities and make rapid changes. This was an effective way to address the fourth lesson from Cohort 1. Table 4 shows the similarity with Cohort 1's engagement plan.

Table 4. Process involved in maintaining the engagement of Cohort 2 in Year 1

Cohort 2 engagement plan in Year 1
Enroll with MOU
Kick-off meeting and workshop
Ammonia refrigeration best-practice training workshop
Monthly energy efficiency progress meetings
Site system assessment and workshop
Individual site assessment
Goal achievement report out

This strategy of common technology-defined cohorts has delivered more rapid and larger savings than the first cohort. Vermont is seeing a benefit in working with cohorts to achieve meaningful energy savings *before* introducing the more abstract and resource-intensive concepts such as employee engagement. Although an evaluation of Year 1 performance of Cohort 2 alongside Cohort 1’s savings persistence will have significant quantitative value, Year 2 of Cohort 2 will address broader, strategic company-wide efforts such as the energy management assessment (EMA) and employee engagement activities. This activity will be concurrent with implementation of the technical savings opportunities identified in Year 1. Table 5 shows preliminary results.

Table 5. Cohort 2 savings from Year 1 activity (results not yet verified by a third party)

Savings categories	Evaluated savings in MWh / year
Capital project savings	1,347.5
CEI savings	1,921.1
Total facility savings	3,268.6
Average savings per facility	5.4%

Looking Forward – A Strategy for Cohort 3

How can we get the strong peer-to-peer sharing experience in concepts centered on strategic energy management, while obtaining strong program savings and generating excitement among customers about saving energy?

Using the experience from two different types of cohort as a foundation to build a third cohort, and while the CEI program is still under pilot (R&D) status, what better way than to try a melding of the two? Efficiency Vermont is now designing a third cohort for large industrial and institutional customers with large, direct-exchange, chilled-water efficiency opportunities. In all cases, customers will be working with a commissioning agent or engineering design firm, which will retro-commission their systems during the project.

One key element of this cohort strategy is to allow the system engineers / commissioning agents to present their findings to the group. This presentation of findings will engage the group in discussing opportunities all customers can take back to their facilities to achieve some quick

wins in energy savings. At the same time, cohort exchanges will offer the chance to broaden the dialog to more strategic energy management topics. The EMA will be introduced in a group setting, but the real work will happen between the Efficiency Vermont account manager and the customer. Once each customer is seeing energy savings and improved system performance, in addition to working on the EMA, the timing will be right to offer workshops on employee engagement.

Table 6 presents the key features of each cohort, by year.

Table 6. Progress and achievements of each cohort, including Cohort 3, in the context of EMA

	Cohort 1	Cohort 2	Cohort 3
Year 1	<ul style="list-style-type: none"> Engage leadership Holistic EMA Employee engagement 	<ul style="list-style-type: none"> Engage, train staff in saving energy Technical focus → best-practices training Consistent third-party assessment performed 	<ul style="list-style-type: none"> Address particular subsystem → technical focus Weave the EMA earlier into the discussion Include service providers Introduce employee engagement
Year 2	<ul style="list-style-type: none"> Re-commitment from senior management Tactical employee engagement 	<ul style="list-style-type: none"> Re-engage senior management Data tracking and EMA Employee engagement 	<ul style="list-style-type: none"> Further develop strategic approach to energy management through more tactical employee engagement and other energy management strategies

Conclusion

In the last three years under a CEI pilot authorized by the state’s regulators, Efficiency Vermont has borrowed and refined the cohort model developed under pioneering SEM programs practiced in the Pacific Northwest. The earliest attempt targeted large C&I customers, applied broad CEI concepts, and tracked progress, with the resulting limitation that direct action and results were slow to come. Efficiency Vermont’s second attempt recruited manufacturers in similar markets, with specific technical content. The cohort was smaller, which meant the program could realize energy savings, but it came at the cost of losing direct engagement with senior management and thus reducing the chances for dissemination of big-picture CEI concepts to high-level managers responsible for future energy decisions. Although not all elements were achieved during the first year, the engagement offers a platform for introducing these strategic concepts in the two-year duration of the cohort. The third attempt will retain the best elements of the previous cohorts, while concurrently addressing the limitations. Efficiency Vermont is applying the discipline of continuous improvement to its energy efficiency program design, and creating a path toward a well-documented solution for a wide variety of commercial and

industrial customers. Efficiency Vermont's long-term approach with past cohort participants will continue to use the minimum elements to define account management engagement plans.