Catalyst for Change: Creating an Energy Awareness Culture

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ABSTRACT

An organization's culture is rooted in its collective history, which makes change difficult and time consuming. Finding ways to clearly demonstrate desired values and repeating these activities so that they become a natural part of the behaviors of members is a core element in creating an energy awareness culture.

The Northwest's Industrial Efficiency Alliance (IEA) has developed an interactive program designed specifically to build an energy awareness culture in the region's industrial facilities. Through ongoing work with a corporate sponsor, the Employee Energy Awareness Program (EEAP) surveys a company's current successes as well as opportunities for improvement before implementing a program, so that these specific examples can be incorporated. This builds a clear picture of how energy affects the company's bottom line and how staff is a critical part of the solution.

To date the IEA has rolled out awareness programs for several northwest food processing companies. Each of these companies has implemented the programs differently and in ways that best work with their management structure.

The purpose of this paper is to present the methods used for this successful program; demonstrate the efficacy of general energy awareness for shop floor employees; discuss how the EEAP empowers shop floor staff to take ownership in energy saving opportunities; and explain how seemingly insignificant energy awareness actions can change a corporate culture.

Introduction

Experiential learning, a methodology focused on creating a learning process that involves active learning, dialoging, fostering shared values, and providing "hands-on" exercises and behavioral modeling, dates back to the early 20th century ((Roland, Wagner & Weigand 1995). In 2005, the Industrial Efficiency Alliance (IEA) was created by the Northwest Energy Efficiency Alliance (NEEA) to promote Continuous Energy Improvement Process (CEIP) with large industrial customers in the Pacific Northwest. Built on the foundations and methodologies of other improvement programs (i.e. lean, TQM, ISO 1400, etc.), the CEIP model focuses on enabling industrial companies to build energy efficiency awareness.

By adopting CEIP, companies prioritize energy along with other key "bottom-line" considerations, such as profit and production, and better understand how they directly interrelate. The CEIP model requires the following of participants:

- to make a corporate energy commitment,
- to identify energy goals and develop an energy plan to achieve these goals,
- to establish an energy leadership team,
- to provide ongoing energy efficiency and awareness training for personnel, and

- to develop a management structure and metrics system that constantly reviews and assesses progress and opportunities for improvement.

Given the "non-traditional" approach of transforming industrial markets to be highly energy efficient, the IEA also developed a strategy to integrate experiential learning methods into its training program. The goal was to create a culture of energy efficiency awareness within the northwest's pulp and paper and food processing industrial communities.

This paper will provide an overview of the IEA Employee Energy Awareness Program (EEAP), identify examples of "Best Practices" from participants and discuss the impact of energy awareness actions on changing corporate culture.

Methodology

"Training seminars often create insights, but do not always produce the desired changes."
(Roland, Wagner & Weigand 1995, 5)

The IEA Employee Energy Awareness Program (EEAP) aims to educate and build capacity within industrial facilities/companies to apply and sustain effective energy management practices, thereby making these practices a core element of the corporate culture. The IEA uses data and experiences from an industrial facility to design and employ an EEAP, so that activities allow participants to observe and reflect on issues and challenges they see every day in their work environment. They are then encouraged to form initial solutions to address these problems, and then test their ideas within a new framework of energy efficiency (Roland, Wagner & Weigand 1995). Thus, this EEAP model offers participants several experiential learning opportunities, from discussions and hands-on record keeping to identifying common solutions for action.

To be eligible for an EEAP, the company must first make a commitment to achieving energy efficiency goals, and identify a leadership team within the organization to set and manage their energy plans. Working with the IEA, an energy plan is developed and then industrial trainings are offered to key plant personnel, targeted at building their energy efficiency skills and technical knowledge.

Within the leadership team, an "Energy Champion" is chosen who manages the EEAP in their facility. Then IEA works one-on-one with the Energy Champion to prepare an Energy Awareness Kick-off event, as well as a plan which is focused on developing an energy committee that presents energy awareness activities in the plant – engaging staff from senior management and engineering to the shop floor. A more comprehensive explanation of the EEAP model will be detailed later in this paper.

In the initial stage of working with a new industrial customer, the IEA offers a comprehensive program of industrial training in four key systems: Pumps, Motors, Compressed Air and Ammonia Refrigeration. While half of the courses offered were developed by the U.S. Department of Energy (DOE), the IEA took a critical look at DOE coursework, and integrated experiential learning methodology – with a focus on "student"-centered learning. The IEA partnered with the best, national DOE trainers and several technical experts to supplement the coursework with peer and hands-on exercises, case studies and even plant tours that facilitate visual, auditory, and kinesthetic learning. (Vidacovich 2000) Furthermore, IEA worked with its

team of experts and instructors to develop six additional training courses that supplement areas not covered by the DOE courses.

By participating in one or several of these industrial training courses, plant personnel are trained in a "whole systems" approach to energy efficiency, which is unlike any other training currently offered in the United States. Furthermore, the IEA program offers energy efficiency fundamentals in compressed air, pumping systems, etc. for shop floor personnel, thereby reaching the majority of the workers in an industrial plant. The EEAP then capitalizes on this training program and makes sure that the everyday decision makers – maintenance staff, technicians – receive better information, technical tips and a supportive environment in which to positively impact energy costs.

Thus, the industrial customer is involved in a process – from the beginning – that reinforces and facilitates their active participation and ownership of energy efficiency change in their organization. The awareness program further highlights the importance of utilizing organization change principles such as effective communication, staff involvement and corporate support. When a company decides to take on an EEAP, it may be their first time; for others, they can use an EEAP to improve a current program and access resources that would otherwise be too time-intensive to develop on their own.

Definition of Players (Stakeholders)

Due to the fact that there are numerous roles and responsibilities in this process, listed below are titles and definitions used in this paper:

- **Participants:** Plant employees-at-large who participate in an EEAP. Ideally, a small group of participants is selected, or self-selects, to be a part of an energy team, contributing their specific technical knowledge of the various systems (Pumps, Compressed Air, etc.) running in the plant.
- **Energy Champion:** Plant employee who takes on the role of leading the EEAP in their facility. In some cases, he/she may manage a small energy team who regularly meet and report on progress, metrics, results and challenges.
- **Management Sponsor:** Decision-maker interested in empowering individuals to become champions or supporting the champion in implementing an EEAP. Have the authority and passion to approve and promote EEAP activities.
- **Channel Director (Food Processing):** Food processing industry specialist who is well-connected to the industry, has good working relationships with utility partners, understands change management, and can clearly communicate with plant management the value of investing time in a rigorous training process. The director also serves as a mentor to the Energy Champion in the initial stages of an EEAP, helping the champion establish goals and an energy team, and access training and other resources.
- **Utility Partner:** Utility representative who has good working knowledge of what is going on in each facility within a specific geographic region. Clearly understands the challenges facing the food processing industry and is open-minded to a different training methodology that requires a high degree of participation and support.
- **Training Logistics Center:** Creative and innovative training support center that can work with a dynamic training process and be a catalyst for change. Able to manage multiple schedules and work with utilities and food processing facilities at multiple

levels. Also able to engage technical specialist to facilitate great project/program management.

Program Goals

It is important to outline the goals for the IEA Employee Energy Awareness Program. Some companies may be able to develop a program that achieves all the goals in a clearly defined, shorter-term period (i.e., annually), while others may only be able to achieve the goals over a longer period of time, particularly if energy efficiency practices are new to the organizational structure. In either case, the company receives ongoing support from the IEA by participating in a Continuous Energy Improvement Process, such as having access to technical experts and thereby building closer relationships with their utility providers. The goals of the IEA Employee Energy Awareness Program are to:

- build internal corporate and facility capacity to apply and sustain effective energy management practices
- support the implementation of a corporate energy policy
- empower and train an Energy Champion to build an energy team that integrates across the plant's systems and works with management to establish system-based energy goals
- provide ongoing opportunities for plant personnel to learn and make suggestions for improvement
- reward employees who show leadership and begin to "own" energy efficiency in their areas of responsibility
- develop and maintain a culture of energy awareness through activities that engage participants in active learning, a culture which:
  - builds morale,
  - creates a functional sense of teamwork, and
  - provides a non-threatening environment for dialoging about challenges and finding solutions.

Program Components

"It's important that you listen to anyone who has an idea. If one of their ideas becomes something that we're going to do, give that individual credit… this has been a very good motivator for employees, so they believe that the management is serious about energy efficiency." Senior Manager, Northwest Food Processing Company

The IEA Employee Energy Awareness Program is comprised of six main components:

1. Establishment of a facility-specific Energy Committee that meets on a regular basis
2. A "Train the Trainer" Workshop
3. Energy Committee develops the "Six Steps" of an EEAP
4. EEAP Kick-off event at participating facility
5. EEAP Materials and Activities used on an ongoing basis
6. Additional resources and mentoring from the IEA on an as-needed basis

Component I

The first task for an Energy Champion, who will be overseeing a new EEAP, is to work with management to identify and set up an energy committee. The committee is made up of colleagues who put the program into action – they build energy awareness using the IEA materials and activities, and bring new ideas and suggestions to bi-weekly or monthly meetings for consideration and follow up. The committee members should represent each of the various systems in the plant, such as compressed air, pumps or motors, and exhibit qualities similar to those of the champion:

1. Has displayed leadership in the past (at or outside work)
2. Looks for opportunities to make change; is a change agent
3. Is participative in plant meetings
4. Has the ability to collaborate with and/or motivate others
5. Has good problem solving skills

Component II

With an Energy Committee in place and regular meetings planned, the next step is to train the Energy Champion (with an option to offer to a couple members of the committee) in how to develop and employ an awareness program. Working with one or more utility providers, the IEA holds a "Train the Trainer" workshop for leaders from several other facilities. The full-day workshop is divided into "Six Steps to Success" and includes ten hands-on exercises. Following a brainstorming session by participants in which they identify "successful" components of an EEAP, and a presentation on the basics of organizational change, the workshop leader outlines and facilitates discussion and activities around the Six Steps:

Step 1: Establish energy saving, awareness and program reporting goals
Step 2: Create a leadership team
Step 3: Create an EEAP framework and a communication plan
Step 4: Assemble tools and resources
Step 5: Recognize and reward (This comes before step 5 so participants can first identify how their organizational culture currently works, what motivates people to change their behavior and therefore, what considerations to include when implementing the program.)
Step 6: Implement the program

Upon completion of the workshop, participants not only have a model and workbook for an EEAP, but the IEA offers them a template presentation for their Kick-off event, as well as a suite of materials and activities designed to support an awareness program.

Component III

When developing the "Six Steps" of an EEAP, the Energy Champion should work collaboratively with his/her energy committee and seek input from corporate management. For first-timers, the IEA encourages a facility to keep it simple, focus on reaching an achievable energy goal and from this build their framework and plan. The Champion will highlight their energy goal and various areas for action to build his/her presentation for the kick-off event.

Component IV

The Kick-off event is ideally presented to all facility personnel, often over several shifts. The IEA provides direct support by inviting participation by the facility's utility provider and any key vendors, and organizing energy-efficient prizes, such as compact fluorescent light bulbs, low-flow showerheads or gift certificates towards the purchase of energy efficient appliances. A unique feature of the Kick-off presentation is the section that focuses on "What you can do at home" to save on energy costs. By making a workplace activity relevant on a personal level, "participants are likely to apply what they learn with more enthusiasm and remember their learning longer." (Roland, Wagner & Weigand 1995, 44)

Component V

As mentioned earlier, the IEA Employee Energy Awareness Program includes a suite of materials that help an Energy Champion and committee present ongoing activities around energy efficiency, and motivate staff to achieve their facility's energy goals. To date, the IEA has developed eight different sets of materials ranging from posters to "toolbox talk cards" on energy efficiency by system (i.e. compressed air, refrigeration). An overview of three types of the materials offered is provided in Table 1.

Table 1. IEA Employee Energy Awareness Program Materials

Item	Description	Goals
Energy Efficiency Team Board	Similar to a standard Safety Board; provides a template with checklist of ideas and materials for designing this board.	• To post a plant's energy policy and goal(s), its progress and status updates, energy committee meeting minutes and pictures of members, etc. • To encourage professional and skill development by posting training opportunities • To recognize plant staff for their suggestions and/or achievements. (This program could compliment an existing corporate recognition program.)
"Toolbox Talk Cards:" Weekly talking points on Energy Efficiency	Three sets of cards (140 cards total) are provided, with topics ranging from energy efficiency tips for the home to introductory and advanced energy systems in compressed air, motors, natural gas, pumps, refrigeration and electric utility services.	• To provide key learning points and discussion topics for plant staff during their daily shift meeting, which reinforce energy efficiency practices • To provide ongoing opportunities for the discussion leader to ask for input and track any actions taken by participants in between the weekly "talks"
Plant Energy "Floor Sweep" Checklists by System	The checklist starts with a system commissioning and moves through tips for weekly, monthly and annual checks; systems covered are pumps, motors, compressed air and refrigeration.	• To provide checklists of key energy efficiency "issues" to be assessed and logged during a floor sweep, or on an ongoing basis, performed by plant maintenance staff and/or engineers

Component VI

Finally, the program offers companies the ability to interface with both the IEA and their utility provider on an ongoing basis. As questions or issues arise, participants can request additional resources or expert input from the IEA. As well, when a facility achieves an annual goal, the IEA and utility can help hold a celebratory event that recognizes leaders and staff who were instrumental in achieving success. Furthermore, participants are encouraged to assess progress and establish new goals on an annual basis, and to share their "lessons learned" and achievements among facilities, with management and key service vendors.

"My advice to new energy champions is continuous communication with your maintenance staff and operations group…you've got to make people believe that you're serious about energy conservation… more times than not, making things easier is more efficient in the operation." (anonymous)President, Northwest Food Processing Company

Program in Action: Examples of Best Practices

In the last 18 months, the IEA has worked with more than ten industrial food processing facilities to develop and kick-off onsite Employee Energy Awareness Programs. The plants have experienced successes and challenges to increasing the capacity of their organization to address and act on energy efficiency opportunities, while also encouraging a "cultural shift" -- empowering shop floor staff to be more involved and managers to be more supportive of new ideas and actions. In this section, we will share examples of "best practices" from several of the participating companies. Due to confidentiality agreements, we are not able to reveal companies and personnel names for some of the participants.

Company "A"

After making a corporate commitment to energy goals and identifying an Energy Champion, a northwest food processor put together a dynamic energy committee with representatives from their main technical systems, departments and shifts. The committee agreed to meet on a monthly basis, with their utility representative serving as an active member. The champion and committee worked directly with the IEA Food Processing Channel Director and Training Director to present a plant-wide kick-off event. The event was presented by the Energy Champion to a core leadership of ninety people, both salaried and hourly, with the IEA and their utility representatives present to provide support and prizes. Based on feedback from the event, the Energy Champion and committee identified specific awareness activities that would best support their goals. The Energy Champion proceeded to roll out an employee awareness program in his facility with the input and support of his energy committee and management. These recommendations were used to help further improve some of the EEAP materials, such as the Toolbox cards and system posters.

Over the course of six months, this facility's EEAP generated more than 50 suggestions from shop floor employees. As well, they achieved 40% of their first annual energy goal by measuring Key Performance Indicators across their refrigeration and compressed air systems. They also used these indicators to evaluate their re-work process and identified that the re-work process had claimed 40% of their potential savings. In response, they developed new re-work procedures and management metrics to help them achieve 100% of their energy goal in the future.

Finally, management invited the Energy Champion to give a "Year in Review" presentation, which he then repeated at a celebration luncheon. The presentation highlighted their achievements and recognized key staff for their successes. Two additional results: The success realized by this facility motivated several other company facilities to ask for this program and it confirmed the corporate sponsors' decision to initiate and support the EEAP process. A senior manager stated, "We believe that a lot of our success will be based on the people on the floor, just as with safety or production. Alone I can't create change, but the people on the floor can change how they manage energy day-to-day."

Even with a program that is reaping positive results, a senior manager from this company finds its biggest challenge to be, "…to get all of this energy efficiency work on the fast track because many things need to be done before we enter processing. There are many variables that need to be considered, but if the program doesn't keep momentum and see results, then people tend to slack off." However, this company has one advantage - the dedication of its corporate

leaders to an energy plan and goals. As stated by another senior manager, "This is my advice to other companies who are interested in energy efficiency – you really need to explore this idea… I believe that if you don't go forward with energy productivity opportunities, you are going backwards. Obviously, five years ago nobody thought about the ramifications of a $75 barrel of oil. If energy isn't high on your radar screen now, it should be, because it's just like you manage everything else in your company."

Company "B"

This next food processing company is nationally based, which has one production facility in the Pacific Northwest and the rest in the Midwestern states of the U.S. Its corporate managers were initially very skeptical about the IEA and viewed the Continuous Energy Improvement Process (CEIP) as time-intensive with no real benefit. Their utility recommended the CEIP process and played a key role in introducing the company to the IEA and its work. A maintenance manager, who is second in command to the plant manager, demonstrated a passion to pursue CEIP. This manager and a few key maintenance staff attended a one-day IEA training, and soon after agreed to participate in a two-day Industrial Mentored Training on Compressed Air sponsored by their utility and the IEA.

The maintenance manager, who is widely respected, took on the role as the facility's Energy Champion. Following training, the champion began an EEAP as a departmental initiative that was administered by the maintenance team. The personnel, who had also received training, became leaders for their energy efficiency efforts. After presenting a plant-wide Employee Energy Awareness kick-off event, the Energy Champion instituted a process that requires every new employee to view the EEAP kick-off presentation as a part of their orientation. This facility's results over the past eight months have been exemplary and include:

- Established Key Performance Indicators for their compressed air system and monitor for future reference on internal software monitoring system:
  - Established a plant baseline at 1400 SCFM - now down to 1293 SCFM
  - Monitored SCFM, kW and machine Amps
  - Inventoried equipment to detect compressed air needs and reset
  - Able to shut down a 75horsepower compressor for 90% of time

- Instituted a compressed air leak detection and repair program with repair documentation
  - Tagged and repaired over 30 compressed air leaks

- Identified inappropriate uses of compressed air (using compressed air for unnecessary activities and that generate high energy costs):
  - Replaced electrical cabinet coolers
  - Replaced compressor generated vacuum with a vacuum pump (more efficient)

- Installed a new, more efficient air receiver for the compressed air system

- Identified three capital projects to propose for utility funding to further improve the performance of their compressed air system

Total estimated savings for this facility are 1,639,343 kWh per year, which is equivalent to a savings of $82,000 per year in energy costs (at $.05 per kWh). These energy savings represent the equivalent of $1.5 million in sales for this company (at a profit margin of 5%). In other words, this company would have to generate sales of $1.5 million to make up for the $82,000 in energy costs.

This company's success is an example of how a leader can embrace solutions-based training and directly apply the new knowledge and skills into the development and rollout of an energy efficiency initiative. However, it remains a challenge for this facility to not have these energy goals be realized as a corporate initiative, and remain highly dependent on one dynamic leader. Nevertheless, the Energy Champion is receiving more corporate support for his activities, such as capital support for energy projects.

Summary of Results

Although it is still a relatively new program, the Industrial Efficiency Alliance's Employee Energy Awareness Program is attaining and documenting energy efficiency actions and the adoption of a corporate culture that integrates energy into underlying operational activities and decision-making processes. By building greater energy awareness through an iterative, innovative and interactive process, the participating companies and/or facilities can apply and sustain effective energy management practices over the long term.

The effective results of the program thus far have also supported IEA's work with corporate management to designate and empower an internal leader – an Energy Champion – to oversee, establish and drive energy efficiency performance. An Energy Champion plays a key role in motivating an energy team and shop floor personnel; by building a team and developing open communications, a Champion is able to hold people accountable to deliverables in a trusting, non-threatening work environment. The Energy Champion also plays a critical role in rewarding employees who show leadership and encouraging other managers to enable their staff to begin to "own" energy efficiency in their areas of responsibility. "Efficiency activities don't sustain savings, ownership does." (Dunn 2005).

Furthermore, the program reaps broader success when an EEAP is integrated across the plant's systems and is coordinated with management to establish system-based energy goals. An EEAP and energy policy may not be sustaining if this doesn't happen.

Many challenges remain that the program seeks to address or resolve. For example, after initial success, some companies see a drop-off in employee enthusiasm or interest for the new efficiency activities or work duties. This reiterates the importance of defining new opportunities for plant personnel to learn and make suggestions for improvement, and to give them the responsibility to maintain and increase momentum within their areas of expertise. As stated by an operations staffer from a northwest food processing facility: "People have been doing these jobs for many years and change is a tough thing… If they perceive that the management team isn't backing this, if it's just 'another program,' then we don't see the results we want. That's why we're getting the message out – that in order to sustain the business and to keep their jobs, they need to participate."

In the end, this awareness program was built on the successful features of other improvement programs, such as lean manufacturing, and is having a positive impact on companies who participate in a comprehensive Continuous Energy Improvement Process. By seeking to create a culture of energy awareness, companies are realizing numerous benefits

including improved employee morale and trust between management and employees, a functional sense of teamwork, and a non-threatening environment for dialoging about challenges and finding solutions.

We could sum up what we've heard from several customers with the phrase, "Small changes equal significant savings." Thus, our approach so far is proving true: Seemingly insignificant energy awareness actions ***can*** change a corporate culture.

References

-----. 2002. "Case Study: Kent Brewery Sydney: Carlton and United Breweries Best Practice People and Processes." Department of Industry, Tourism and Resources, Australia.

Barbazette, Jean. 2006. *Training Needs Assessment- Methods, Tools, and Techniques.* San Francisco, Calif.: Pfeiffer.

Biech, Elaine. 2005. *Training for Dummies*. Indianapolis, Ind..: Wiley Publishing.

Birch, Ed (Industrial Efficiency Alliance). 2007. Personal communication. January and April.

Bowman, Sharon L. 2005. *The Ten-minute Trainer*. San Francisco, Calif.: Wiley and Sons, Inc.

Clark, Carolyn. 1997. *Creating a Climate for Power Learning*. Duluth, Mich.: Whole Person Associates.

Dunn, Tom (Senior Engineering Specialist for the Weyerhaeuser Corporation). 2005. Personal communication. November.

Roland, Christopher, Wagner, Richard, Weigand, Robert. 1995. *Do It and Understand: The Bottom Line on Corporate Experiential Learning.* Dubuque, Iowa: Kendall/Hunt Publishing Company.

Russell, Rob (Northwest Energy Efficiency Alliance). 2007. Personal communication. March.

Tannenbaum, Bobbi. 2006. "Training: Designing for Lasting Change." In *Proceedings of the ACEEE 2006 Summer Study on Efficiency in Buildings, <<Pages; 6:215-226>>*.

Vidakovich, Jim. 2000. *Trainers in Motion: Creating a Participant-Centered Learning Experience.* New York, N.Y.: AMACOM American Management Association.