

Planning for an Effective Energy Management Program

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http://www.energyusernews.com/CDA/Article_Information/Fundamentals_Item/0,2637,6697,00.html

The headline in the local newspaper caught my eye - "Lower energy use leaves experts pleased but puzzled." The article stated that "Although the data are preliminary, experts are baffled that the country appears to have broken the decades-old link between economic growth and energy consumption."

For those of us who have been involved in energy management for many years, this article contained no news. We have seen, in the last few years, companies becoming more efficient in their use of energy, which shows in the data. Companies that have exacted all possible savings from downsizing are looking for new ways to become more competitive. Better management of energy is a viable way to cut costs, so more companies are establishing energy management programs.

With the new technologies and alternative energy sources now available, this country could possibly reduce its energy consumption by 50%-if there were no barriers to implementation. But of course, there are barriers, mostly economic. Therefore, we might conclude that managing energy is not just a technical challenge, but one of how to best implement those technical changes within economic limits, with a minimum of disruption.

Unlike other management fads, such as value analysis and quality circles, that have come and gone, energy management will have a long-lasting place in business.

There are several reasons for this:

- There is direct economic return
- Most manufacturing companies are looking for a competitive edge
- Energy technology is changing rapidly; state-of-the-art techniques have half lives of 10 years at the most
- Energy management includes energy security

Facilities managers who choose-or are drafted-to manage energy will do well to recognize this continuing need and exert the extra effort to become skilled in this emerging and dynamic profession.

Energy Manager

Management support is very important to the success of an energy management program. Even more important is the selection of an energy manager who can secure this support. The energy manager should have a vision of what managing energy can do for the business. Every successful program has a mover and shaker who makes things happen. The energy program is built around this person.

Some energy managers take on too much of the burden, trying to be energy engineers as well as energy managers. Although individuals working alone can accomplish much, for the long haul, programs that involve everyone at a facility are much more productive and permanent. Developing a working organizational structure may be the most important thing an energy manager does.

The Energy Policy Act of 1992 (EPACT) changed the role and qualifications of the energy manager. For instance, EPACT requires certification of federal energy managers, deregulation of the electric utility industry, and performance contracting, which adds business acumen to the job qualifications for energy managers.

In her book *Performance Contracting: Expanded Horizons*, Shirley Hansen lists the following requirements for an energy manager:

- Set up an energy management plan
- Establish energy records
- Identify outside assistance
- Assess future energy needs
- Identify financing sources
- Make energy recommendations
- Implement recommendations
- Provide liaison for the energy committee
- Plan communication strategies
- Evaluate program effectiveness

Energy management programs can, and do, originate within a single division of a large corporation. The division, by example and savings, causes people at the corporate level to imitate the program. Other times corporate personnel initiate programs. These corporate people have facilities responsibility and have implemented good corporate facilities programs. They see the importance and potential of an energy management program and take a leadership role in implementing one. In every case observed by the author, good programs have been initiated by one individual who has recognized the potential, put forth extra effort, taken the risk of pushing new concepts, and seemed to have a higher calling to save energy.

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Corporate Programs

When a program is initiated at the corporate level, there are some advantages:

- More resources are available to implement the program, such as budget, staff, and facilities
- Top management support can be used to get management support at lower levels
- The existence of expertise throughout the corporation is better known and can be made available to division energy managers
- Expensive test equipment can be purchased and maintained at corporate level for use by other entities as needed
- A unified reporting system can be put in place
- Creative financing may be the most needed and the most important assistance to be provided from corporate level
- Corporate personnel can best determine the affects of energy and environmental legislation
- Corporate personnel can best evaluate electrical utility rates and structures, as well as the effects of unbundling of electric utilities

However, corporate-level energy managers must be aware that some divisions may have already done a good job of saving energy. Division personnel may worry about corporate-level staff taking

credit for their work. Also, all divisions don't progress at the same speed. Work with those who are most interested first, then give them credit to top management. Others divisions will then request assistance.

Energy Team

The energy team is the core of the program. The main criterion for membership should be interest. Administration groups, such as accounting or purchasing, facilities and maintenance, and each major department should be represented.

Team members should be appointed for a specific time period, such as one year. Annual membership rotation can allow new people with new ideas to participate, provides a mechanism for tactfully removing non-performers, and involves greater numbers of people in the program in a meaningful way.

Team members should be selected to supplement skills the energy manager lacks; it is unrealistic to think one energy manager can have all the skills. The team, however, must:

- Have enough technical knowledge to understand the technology used by the organization, or be trained in that technology
- Have a knowledge of potential new energy-saving technologies
- Have planning skills that will help establish the organizational structure, plan energy surveys, determine educational needs, and develop a strategic energy management plan
- Understand the economic evaluation system used by the organization, particularly payback and life-cycle cost analysis
- Have good communication and motivational, skills since energy management involves everyone within the organization

The strengths of each team member should be evaluated using the skill list above and their assignments made accordingly.

Employees

Employees are perhaps the greatest untapped resource in an energy management program. A structured method of soliciting their ideas for more efficient use of energy can prove to be the most productive effort of the energy management program. A good energy manager will spend 20% of the year working with employees. Too many times employee involvement is limited to posters that say "Save Energy." Employees in manufacturing plants generally know more about the equipment than anyone else in the facility because they operate it. They know how to make it run more efficiently, but because there is no procedure in place for them to have any input, their ideas go unsolicited.

An understanding of the psychology of motivation is necessary before an employee involvement program can be successfully conducted. Motivation may be defined as the amount of physical and mental energy that a worker is willing to invest in a job. Three key motivation factors are listed:

- Motivation is already within people. The task of the supervisor is not to provide motivation, but to know how to release it.
- The amount of energy and enthusiasm people are willing to invest in their work varies with the individual. Not all are overachievers, but not all are lazy either.
- The amount of personal satisfaction derived from a task determines the amount of energy an employee will invest in the job. Achieving personal satisfaction has been the subject of much research by industrial psychologists, and they have emerged with some revealing facts. For example, they have learned that most actions taken by people are done to

satisfy a physical need, such as the need for food, or an emotional need, such as the need for acceptance, recognition, or achievement. Research has also shown that many efforts to motivate employees deal almost exclusively with trying to satisfy physical needs, such as raises, bonuses, or fringe benefits. These methods are effective only for the short term, so we must look beyond these to other needs that may be sources of releasing motivation,

A study done by Hersey and Blanchard in 1977 asked workers to rank job-related factors listed below. The results:

1. Full appreciation for work done
2. Feeling "in" on things
3. Understanding of personal problems
4. Job security
5. Good wages
6. Interesting work
7. Promoting within the company and growth
8. Management loyalty to workers
9. Good working conditions
10. Tactful discipline of workers

This priority list will no doubt need to be changed over time and customized for individual companies, but the rankings of what supervisors thought employees wanted were almost diametrically opposed. They ranked good wages first.

Knowing that job enrichment is a key to motivation, the energy manager can involve employees in a program by providing some simple and inexpensive recognition.

Educational Planning

A major part of the energy manager's job is to provide energy education for the organization. After two decades of effort, ignorance concerning energy remains a big problem.

Raising the energy education level throughout the organization can have big dividends. An energy program will operate much more effectively if management understands the complexities of energy, and particularly the potential for an economic benefit. The coordinators will be more effective when they are able to prioritize energy conservation measures and are aware of the latest technology. Finally, the quality and quantity of employee suggestions will improve significantly with training. Educational training should be considered for management, the energy team, and employees.

Management Training

Subtle ways must be developed to get them up to speed. Getting time on a regular meeting to provide updates on the program is one way. After the momentum of the program gets going, it may be advantageous to have a half- or one-day presentation for management.

A periodical, concise report can be a tool to educate management. Short articles that are pertinent to the educational goals, taken from magazines and newspapers, can be attached to reports and sent selectively. Having management be a part of a training program for either the energy team or employees, or both, can be an educational experience, since we learn best when we have to make a presentation.

Energy Team Training

Since the energy team is the core group of the energy management program, proper and thorough training for them should have the highest priority. Training is available from many sources and in many forms.

- Self study-requires a good library of energy-related materials for coordinators
- In-house training-may be done by a qualified member of the team or an outside consultant
- Short courses offered by associations such as the Association of Energy Engineers, by individual consultants, by corporations, and by colleges and universities
- Comprehensive courses of one to four weeks duration offered by universities, such the one at the University of Wisconsin, and the one being run cooperatively by Virginia Tech and North Carolina State.

For large decentralized organizations with ten or more regional energy managers, an annual two- or three-day seminar can be the base for the educational program. Such a program should be planned carefully. The following suggestions should be incorporated into such a program:

- Select quality speakers from inside and outside the organization.
- Invite a top-level executive from the organization to give opening remarks. It may be wise to offer to write the remarks, or at least to provide some material for inclusion.
- Involve the participants in workshop activities so they can provide input to the program. Also, provide some practical tips on energy savings that they might go back and implement immediately. One or two good ideas can pay for their time in the seminar.
- Make the seminar first class with professional speakers, a banquet with an entertaining after-dinner speaker, and a manual that includes a schedule of events, sketches of speakers, list of attendees, and information on each topic presented. Vendors may contribute door prizes. You may wish to develop a logo for the program, and include it on small favors such as cups, carrying cases, etc.

Employee Training

A systematic approach for involving employees should start with some basic training in energy. This will help them develop better ideas. Employees value training, so morale may also improve. Simply teaching the difference between electrical demand and kilowatt-hours of energy, and that compressed air is very expensive is a good beginning. Short training sessions on energy can be made part of other training for employees. A more comprehensive training program should include:

- Energy conservation in the home
- Fundamentals of electrical energy
- Fundamentals of energy systems
- How energy surveys are conducted and what to look for

Audit Planning

With the maturing of performance contracting, energy managers have two choices for the energy audit process. They can go through the contracting process to select and define the work of a performance contractor, or they can set up their own team and conduct audits. A corporate energy manager may order performance contracting at one facility and energy auditing at another. Performance contracting requires no investment other than that involved in the contracting

process (which can be very time consuming). Just the energy manager and financial personnel are involved.

However, there are disadvantages:

- c Technical resources are generally limited to the contracting organization
- Performance contracting is still maturing, and many firms underestimate the work required
- The contractor may not have all the skills needed
- The contractor may not have an interest in low-cost or no-cost projects

The audit team approach also has risks. Financing identified projects becomes a separate issue for the energy manager, and a well-organized energy management structure is needed to take full advantage of the work of the audit team.

Audit teams, however, can be selected to match equipment to be audited and can be made up of in-house personnel, outside specialists, or best, a combination of both.

They can identify all low-cost and no-cost energy conservation projects, as well as projects requiring large capital investments. The audit often serves as an excellent training tool because other personnel become part of the process. Sometimes a training component can be added to the audit process.

Ownership

The key to a successful energy management program can be described using one word-ownership. Program ownership must extend to everyone within the organization. Employees who operate a machine "own" that machine. Any attempt to modify their "baby" without their participation will not succeed. Members of the energy team are not going to be interested in seeing one person-the energy manager-get all the fame and glory for their efforts. Managers who invest in energy projects want to share in the recognition for their risk taking. A corporate energy team that goes into a division for an energy audit must help put a person from the division in the energy management position and then make sure the audit belongs to the division. Ownership is the most important key, but below are some others.

Tips for Success

In observing successful energy management programs, the following tips for success have been compiled:

- Have a plan that deals with organization, surveys, training, and strategic planning that has scheduled events. Advantages include avoiding disruptions by non-productive ideas, and setting up scheduled events that keep the program active.
- Give away-or at least share-ideas for saving energy. The surest way to kill a project is to be possessive. If others have a vested interest they will help make it work.
- Be aggressive. The energy team-after some training-will be the most energy knowledgeable group within the company. Too many management decisions are made with a meager knowledge of the effects on energy management.
- Use proven technology. Many programs get bogged down trying to make a new technology work and lose sight of the easy projects with good payback. Don't buy serial number one. Price breaks and promises of support will not overcome the problems of beta testing a solution.
- Go with the winners. Not every department within a company will be enthused about the energy program. Make enthusiasts look good through the reporting system to top management and others will follow.

- A final major tip-ask the machine operators what should be done to reduce energy use. Then make sure they get proper recognition for ideas.

Conclusion

Energy management has now matured to the point that it offers outstanding opportunities for those willing to invest time and effort to learn the fundamentals. Technical and management skills that will broaden the educational needs for those desiring to enter this field are required. Because of the economic return of energy management, it is attractive to top management, so exposure of the energy manager at this level brings added opportunity for recognition and advancement. There is a continuous need for managing energy, so persons with this skill will have job security as we are caught up in the downsizing fad now permeating our society.

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