



PDHonline Course E372 (2 PDH)

Energy Management

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How to Develop an Energy Management Plan

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Information for this course is taken from the U.S. Environmental Protection Agency's ENERGY STAR program. ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy.

Introduction

Increasing energy demand, global climate change, and constrained energy supplies are likely to impact how energy affects businesses in the future. Market trends suggest that the demand for energy resources will rise dramatically over the next 25 years. For instance, global demand for all energy sources is forecast to grow by 57% over the next 25 years. U.S. demand for all types of energy is expected to increase by 31% within 25 years. Electricity demand in the U.S. will grow by at least 40% by 2032. New power generation equal to nearly 300 power plants will be needed to meet electricity demand by 2030. Currently, 50% of U.S. electrical generation relies on coal, a fossil fuel; while 85% of U.S. greenhouse gas emissions result from energy-consuming activities supported by fossil fuels.

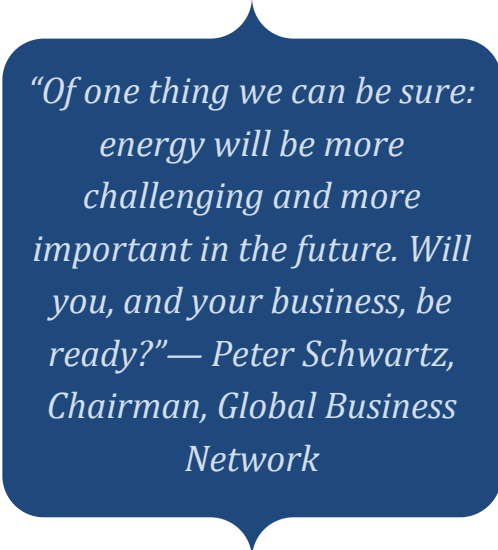
Whether a business is in manufacturing, real estate, retail, healthcare, education or government, controlling and cutting costs is important for success. Reducing energy use and increasing energy efficiency is a proven strategy for cutting and controlling costs with good returns.

Even with good returns, energy waste is still prevalent throughout organizations. Consider that:

- A 400% variation in energy use intensity of buildings in the United States exists that is not explained by age, technology, hours, size, climate.
- Little improvement of overall energy consumption has been seen although building components are 30% more efficient since 1980.
- Oversizing building fan systems, on average, occurs by 60%.
- Most chillers are oversized by 50–200%.

Unfortunately, capturing energy waste has been hampered by a lack of focus on energy management. Too often energy management is characterized as being decentralized, poorly-coordinated, focused on paying bills & running the powerhouse, reactive, undervalued, and considered capital intensive.

If energy prices also rise dramatically due to increased demand and constrained supply, business impacts could include:



“Of one thing we can be sure: energy will be more challenging and more important in the future. Will you, and your business, be ready?” — Peter Schwartz, Chairman, Global Business Network

- Reduced profits due to high operating costs.
- Decline of sales of energy-using products.
- Loss of competitiveness in energy intensive businesses.
- Disruptions in supply chains as suppliers are unable to meet cost obligations or go bankrupt.

Organizations that have adopted effective energy management strategies and built successful energy programs have had different results. Consider the following:

- Ford Motor Company has saved over \$75 million through effective energy management.
- USAA Real Estate has realized a 5% annual energy savings and increased the asset value of a California building by \$1.5 million due to energy efficiency upgrades.
- Hines estimates the difference in operational costs between its energy efficient buildings and inefficient buildings at more than \$13 million.
- Fairfax County Public Schools estimates an annual energy savings of \$4.5 million from energy efficiency improvements.

The value of strong energy management as a proxy for overall organizational management is increasingly recognized by financial analysts. Recent studies by Innovest Strategic Value Advisors found that leaders in energy management achieved superior stock and financial performance over laggards in energy management. The difference between the leaders and laggards is significant:

- Real estate investment sector — over 3,400 basis points difference
- Retail food sector — 1700 basis points difference
- Retail merchandising — 7100 basis points difference

The bottom line — good energy management is good business, and adopting an energy management strategy is a business decision that should not be ignored.

The purpose of this course is to outline the steps necessary to develop a successful energy management program and the overview on the next page will give you an outline of the process.

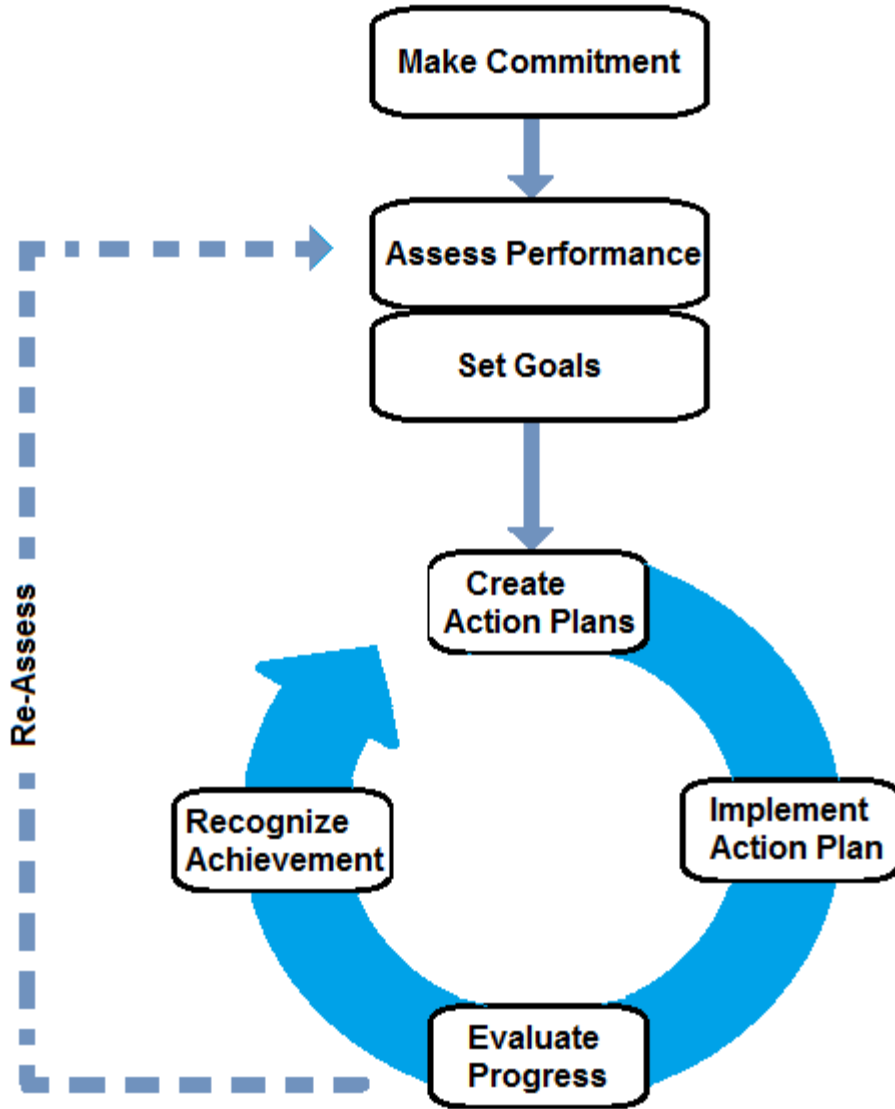
Overview

The process discussed in this course was developed by the EPA and is actually a good format for energy management. It offers a proven strategy for superior energy management with tools and resources to help each step of the way.

These guidelines for energy management can assist an organization in improving its energy and financial performance while distinguishing the organization as an environmental leader. The process is divided into a 7-step program. The steps are:



The first step in an effective energy management program is to make a commitment to energy management. Next is a detailed examination of the current performance of the organization. Then it is time to set goals. Once goals are set, action plans can be created to start the process. The action plans are implemented and then it is time to begin evaluating progress. Once goals are achieved it is important to recognize the successes and then modify or create new action plans to formulate a plan of continuous improvement. The performance will need to be reassessed from time to time and new goals set. Graphically, the process looks like this,



Next, we will review each step in the process, starting with step one, making a commitment to continuous improvement.

STEP 1

Make a Commitment

Organizations seeing the financial returns from superior energy management continuously strive to improve their energy performance. Their success is based on regularly assessing energy performance and implementing steps to increase energy efficiency.

No matter the size or type of organization, the common element of successful energy management is commitment. Organizations make a commitment to allocate staff and funding to achieve continuous improvement.

To establish their energy program, leading organizations form a dedicated energy team and institute an energy policy. The key steps are to:



- Appoint an Energy Director — Sets goals, tracks progress, and promotes the energy management program.
- Establish an Energy Team — Executes energy management activities across different parts of the organization and ensures integration of best practices.
- Institute an Energy Policy — Provides the foundation for setting performance goals and integrating energy management into an organization's culture and operations.

Appoint an Energy Director

Appointing an Energy Director is a critical component of successful energy programs. An Energy Director helps an organization achieve its goals by establishing energy performance as a core value.

The Energy Director is not always an expert in energy and technical systems. Successful Energy Directors understand how energy management helps the organization achieve its financial and environmental goals and objectives. Depending on the size of the organization, the Energy Director role can be a full-time position or an addition to other responsibilities.

The Energy Director's key duties often include:

- Coordinating and directing the overall energy program
- Acting as the point of contact for senior management

- Increasing the visibility of energy management within the organization
- Drafting an Energy Policy
- Assessing the potential value of improved energy management
- Creating and leading the Energy Team
- Securing sufficient resources to implement strategic energy management
- Assuring accountability and commitment from core parts of the organization
- Identifying opportunities for improvement and ensuring implementation
- Measuring, tracking, evaluating, and communicating results
- Obtaining recognition for achievements

Tip

If the Energy Director does not report directly to a senior manager, it is often helpful for a member of senior management to serve as an “executive ally.” Upper management involvement is a key component of successful programs. Having an ally provides a direct link to upper management and helps to formalize the commitment to continuous improvement.

Establish an Energy Team

Decisions affecting energy use are made every day by people. Creating an Energy Team helps to integrate energy management.

In addition to planning and implementing specific improvements, the team measures and tracks energy performance and communicates with management, employees and other stakeholders. The size of the energy team will vary depending on the size of the organization. In addition to the Energy Director who leads the team and possible dedicated energy staff, consider including a representative from each operational area that significantly affects energy use, such as: Engineering, purchasing, operations and maintenance, building/facilities management, environmental health and safety, corporate real estate and leasing, construction management, contractors and suppliers, and utilities.

Institute an Energy Policy

An Energy Policy provides the foundation for successful energy management. It formalizes senior management’s support and articulates the organization’s commitment to energy efficiency for employees, shareholders, the community and other stakeholders.

Successful organizations have energy policies that:

- State an objective — Have a clear, measurable objective that reflects the organization's commitment, culture and priorities.
- Establish accountability — Institute a chain-of-command, define roles in the organization, and provide the authority for personnel to implement the energy management plan.
- Ensure continuous improvement — Include provisions for evaluating and updating the policy to reflect changing needs and priorities.
- Promote goals — Provide a context for setting performance goals by linking energy goals to overall financial and environmental goals of the organization.

For maximum effectiveness, it is best to have the CEO of the organization officially issue the policy after involving key people in policy development to ensure buy-in. The policy should be tailored to the organization's culture and it should be understandable to employees and public alike. It is wise to consider the skills and abilities of management and employees. The policy should include detail that covers day-to-day operations. Finally, the policy should be communicated to all staff and employees, and encourage them to get involved.

STEP 2

Assess Performance

Understanding current and past energy use is how many organizations identify opportunities to improve energy performance and gain financial benefits. Assessing performance is the periodic process of evaluating energy use for all major facilities and functions in the organization and establishing a baseline for measuring future results of efficiency efforts. Aspects include, data collection, base-lining, benchmarking, Analysis and Evaluation. The key points are to,



- Gather and track data — Collect energy use information and document data over time.
- Establish baselines — Determine the starting point from which to measure progress.
- Benchmark — Compare the energy performance of the facilities to each other, peers and competitors, and over time to prioritize which facilities to focus on for improvements.
- Analyze — Understand the energy use patterns and trends.
- Technical assessments and audits — Evaluate the operating performance of facility systems and equipment to determine improvement potential.

Assessing energy performance helps to categorize current energy use by fuel type, operating division, facility, product line, etc. It can also help, identify high performing facilities for recognition and replicable practices, prioritize poor performing facilities for immediate improvement, understand the contribution of energy expenditures to operating costs, develop a historical perspective and context for future actions and decisions, and establish reference points for measuring and rewarding good performance.

Gather and Track Data

Evaluating energy performance requires good information on how, when, and where energy is being used. Collecting and tracking this information is necessary for establishing baselines and managing energy use.

Organizations of all sizes have established systems for gathering and tracking energy use data. For commercial buildings ENERGY STAR's Portfolio Manager program can be used to track energy use over time. In the case of industrial plants, the ENERGY STAR industry specific

Energy Performance Indicator (EPI) can be used to track yearly energy use patterns. EPIs are currently available for wet corn milling, auto manufacturing and cement manufacturing. All or part of data collection and management can also be outsourced. Regardless of what method is used to gather and track data, consider the steps below. At this point, the key steps are to collect data and establish a tracking system.

The data must be complete and accurate because it will be used for analysis and goal setting. The level and scope of data collection will vary from organization to organization. Some may choose to collect data from submeters on individual processes while others may only look at a utility bill. Inventory all energy purchased and generated on-site (electricity, gas, steam, waste fuels) in physical units (kWh, mMBtu, Mcf, lbs of steam, etc.) and on a cost basis.

For the sources identified above, assemble energy bills, meter readings, and other use data. Energy data may reside in the accounting department, be held centrally or at each facility, or can be acquired by contacting the appropriate utilities or energy service providers. Gather at least two years of monthly data or a more frequent interval if available. Use the most recent data available. To be able to normalize and benchmark, it may be necessary to collect non-energy related data for all facilities and operations, such as building size, operating hours, etc.

A system for tracking performance can range from a simple spreadsheet to detailed databases and IT systems. The design of the tracking system will be shaped, in large part, by the level and scope of information that will be tracked and the frequency of data collection. Tracking systems must be easy to use, update, and maintain. Use tracking systems to communicate energy performance to other parts of the organization and motivate change. Consider developing formats that express energy performance information in ways that are easily understandable across the organization. A good tracking system should make such reporting easy!

Tip

- At a minimum, collect data by fuel type at an individual building or facility level
- Collect data from submeter
- Use actual, not estimated, use data
- Use data that is current and timely
- Use tracking systems to develop quarterly and annual reports that profile energy performance
- Use tracking systems to allow facilities to compare their performance to their peers
- Use an existing tracking system, such as ENERGY STAR's [Portfolio Manager](#) and [Energy Performance Indicators \(EPIs\)](#) to organize data and benchmark against the industry.

Establishing a tracking system requires an investment of time and money. But, once the system is in place, it can pay for itself by highlighting which facilities use the most energy, pointing to

areas of greatest opportunity, and even identifying errors in utility bills, such as overcharges, that might have otherwise gone unnoticed and paid. General Motors estimates that its tracking system, which took over \$1 million to develop, has paid for itself multiple times.

Establish Baselines

Measuring energy performance at a specific time establishes a baseline and provides the starting point for setting goals and evaluating future efforts and overall performance. Baselines should be established for all levels appropriate to the organization.

The main steps involve using the data collected to:

- Establish base year — Establish a base year (weather-normalized) or an average of several historical years. Use the most complete and relevant sets of data available.
- Identify metrics — Select units of measurements that effectively and appropriately express energy performance for the organization. (Btu/square foot, Btu/ product, total energy cost/square foot).
- Publish results — Announce performance baselines to facilities, managers, and other key stakeholders in the organization.

Some voluntary environmental initiatives have specific baseline years. If an organization is participating in such an initiative, check to see if a specific base year has been established. If price is not used as a normalizing factor, then be sure to use a source energy accounting method. Otherwise, if the facilities use a combination of fuels, the baseline data may contain errors.

Benchmark

Benchmarking can be done in variety of ways. Facility or organizational performance may be benchmarked to:

- Past performance — A comparison of current versus historical performance.
- Industry average — Based on an established performance metric, such as the recognized average performance of a peer group.
- Best in class — Benchmarking against the best in the industry and not the average.

- Best Practices — A qualitative comparison against certain, established practices considered to be the best in the industry.

The key steps in benchmarking include: Determine the level of benchmarking (for example — equipment, process line, facility or organizational), develop metrics, conduct comparisons, and track performance over time.

EPA has made this step easier by providing a national energy performance rating system, currently available for office buildings, K-12 schools, grocery stores, hotels, and hospitals. The rating system, found in Portfolio Manager, allows comparisons of performance against similar facilities. In the case of cement, wet corn milling and auto assembly plants the industry specific Energy Performance Indicators (EPIs) serve as national energy performance rating systems to allow for comparison against similar facilities.

ENERGY STAR's Portfolio Manager, compares the energy performance of a facility to similar buildings nationwide. Portfolio Manager also normalizes for weather and several other important building and operational characteristics, allowing comparisons to be made on a level playing field.

By inputting energy and building information, this tool provides a benchmark score on a scale of 1-100. Many of the most effective energy management programs rate the performance of their entire building portfolio. This type of comparison allows energy managers to identify inefficient buildings for upgrades.

EPA recognizes buildings with superior performance. Buildings with a score of 75 or over are eligible for the ENERGY STAR Label and buildings that earn the ENERGY STAR use about 40 percent less energy than average buildings, without compromising comfort or services.

Analyze Data

Analyzing data to determine energy use trends can help an organization gain a better understanding of the factors that affect energy performance and identify steps for reducing energy consumption.

There are a variety of ways data can be analyzed depending upon the needs of the organization. The following analyses provide a starting point:

1. Quantitative Reviews

Identify energy consumption peaks and valleys, and determine how they relate to operations or key events. Compare the use and performance data of similar facilities in the same industry. Identify areas of high-cost energy use. Determine areas where more information is needed.

2. Qualitative Reviews

Seek informed opinions from colleagues, specific anecdotes and lessons learned, systems-specific information (e.g., HVAC, lighting, refrigeration), and in-house audits or surveys. Review organizational policies and operating procedures to determine their impact on energy use.

A good example of using this approach is the University of Virginia program. Metering and benchmarking energy for plants, facilities, space types, and systems are at the heart of the University of Virginia's (UVA) energy management program. With over 577 buildings ranging in age, design, and function, maintaining good data is key for understanding performance and identifying areas for improvement. By analyzing meter and utility use information, UVA's energy management program identifies "energy hogs" that are targeted as energy efficiency opportunities. Energy hogs are flagged by UVA's tracking/trending program whenever it detects high total utility use, high relative utility use (by facility type), or unusual utility use, such as chilled water use during winter months for an office building. These types of issues are identified by an "exception report" and may indicate design or operational problems that warrant further investigation. Through its careful analysis of energy use information, UVA's energy management program was able to control and reduce energy use, saving \$5 million in 2002.

Conduct Technical Assessments & Audits

Knowing an organization's baseline energy use and the relative performance of the entire portfolio is only part of the information needed. Periodic assessment of the performance of equipment, processes, and systems will help identify opportunities for improvement.

Energy audits are comprehensive reviews conducted by energy professionals and/or engineers that evaluate the actual performance of a facility's systems and equipment against their designed performance level or against best available technology. The difference between these is the potential for energy savings.

The main steps for conducting technical assessments and audits are:

1. Assemble audit team

Expertise should cover all energy-using systems, processes, and equipment. Include facility engineers, system specialists, and other support. Outside support may be helpful and provide an objective perspective or specific expertise.

Plan and develop an audit strategy — Identify and prioritize systems for evaluation, assign team members to tasks, and schedule completion dates for the activities. Use benchmarking results to identify poor-performing facilities whose equipment and systems should be targeted for evaluation.

2. Create audit report

Based on the audit results, produce a detailed summary of actual steps that can be taken to reduce energy use. The report should recommend actions from simple adjustments in operation to equipment replacement. Estimates of resource requirements for completing actions should be included.

STEP 3

Set Goals

Performance goals drive energy management activities and promote continuous improvement. Setting clear and measurable goals is critical for understanding intended results, developing effective strategies, and reaping financial gains. Well-stated goals guide daily decision-making and are the basis for tracking and measuring progress. Communicating and posting goals can motivate staff to support energy management efforts throughout the organization. The Energy Director in conjunction with the Energy Team typically develops goals.

To develop effective performance goals:

- Determine scope — Identify organizational and time parameters for goals.
- Estimate potential for improvement — Review baselines, benchmark to determine the potential and order of upgrades, and conduct technical assessments and audits.
- Establish goals - Create and express clear, measurable goals, with target dates, for the entire organization, facilities, and other units.



Setting goals helps the Energy Director. The goals should set the tone for improvement throughout the organization, provide ways to measure the success of the energy management program, help the Energy Team to identify progress and setbacks at a facility level, foster ownership of energy management, create a sense of purpose, and motivate staff, demonstrate commitment to reducing environmental impacts, and create schedules for upgrade activities and identify milestones.

When setting goals, be sure to use the Energy Team's wide range of knowledge to help set aggressive, yet realistic goals. Have management review the goals to enlist their feedback and support.

Determine Scope

The scope of performance goals can include multiple levels of the organization as well as various time periods for completion of specific goals.

The level at which performance goals will be set depends on the nature of the organization and how it uses energy. Common organizational levels for setting goals include:

1. Organization-wide

Setting goals at this level provides a big picture of how the entire organization wants to improve. Organization-wide goals provide a framework for communicating the success of energy management both internal and external audiences.

2. Facility

At this level, goals may vary to take into account the performance of specific facilities based on benchmarking results or an energy audit. Facility level goals are designed to help the broader organization to meet its goals.

3. Process or equipment

Some organizations may find it useful to establish goals for specific process lines and equipment when energy use is concentrated in specific areas. Establishing appropriate and realistic target dates for goals ensures that they are meaningful and promote change. A combination of short and long term goals can be effective. Short-term goals are annual goals provide the necessary markers for tracking and reporting progress on a regular and on-going basis. Long-term goals are usually organization-specific and may be shaped by: Internal rates of return, internal planning horizons and guidelines, organizational strategic plans, and commitments to voluntary environmental initiatives.

A good example is Johnson & Johnson's planning horizons. Johnson & Johnson (J&J) uses a variety of goals and planning horizons to execute change. J&J established organization-wide "Next Generation Goals" for reducing greenhouse gas emissions by 4 percent by 2005 and by 7 percent by 2010 from a baseline of 1990. At the facility level, J&J set a goal of 100 percent completion of its list of best practices by 2005 for all facilities worldwide. J&J's estimates that at the midway point of completing implementation of the best practices, nearly \$20 million had been saved worldwide.

Estimate Potential for Improvement

To set goals, it is important to have an informed idea of what level of performance is achievable and the amount of resources needed. There are a variety ways to determine potential. The method chosen will depend on a number of factors, such as: available resources, time, the nature of energy use at the facilities, and how the energy program is organized.

Methods used by leading energy programs include:

1.Reviewing performance data

Assessing performance and setting baselines should help to identify differences in energy use between similar facilities, giving a limited, point-in-time view of the potential improvement. Performance data spanning a longer period of time will be more useful for understanding improvement potential.

2.Benchmarking

Benchmarking provides a yard stick for evaluating opportunity when enough data is available to show trends in energy use. Consider using Portfolio Manager or the ENERGY STAR Energy Performance Indicators (EPIs) to rate the current energy performance of the facility against similar facilities.

3.Evaluating past projects and best practices

Evaluate past projects and best practices at higher-performing facilities to determine the feasibility of transferring these practices to other parts of the organization.

4.Reviewing technical assessments and audits

Identify opportunities to reduce energy use identified during technical assessments and audits of poorer performing facilities to serve as a strong basis for quantifying the potential for improvement.

5.Comparing goals of similar organizations

Reviewing performance goals of other organizations can provide guidance and information for organization.

6.Linking to organization-wide strategic goals

Strategic as well as operational goals, such as cost reductions, can also help inform the goal setting process.

Establish Goals

Once the potential for improvement has been estimated, goals can be established at the appropriate organizational levels. Energy performance goals should be formally established and recognized by senior management as a mission for the whole organization.

Estimating potential for improvement should provide a starting point for what is possible. However, some organizations set their final energy performance goals based on organizational factors other than what is technically feasible. Such factors will affect how energy performance goals are expressed. Common ways for expressing goals include:

- Defined reduction

Goals are presented in terms of a specific quantity or percentage decrease in energy use, such as a 10 percent reduction or a decrease of 300 million Btus.

- Best-in-class

This goal aims for a certain level of performance compared to an established benchmark.

- Efficiency improvement

Goals are expressed as a function of reducing the energy intensity of a specific performance indicator, such as 2 Btus per unit of product.

- Environmental Improvement

This goal translates energy savings into pollution prevention or reduction goals.

- Threshold goals

The minimum acceptable level of performance.

- Stretch goals

Levels beyond the minimum or targets that are used to create an incentive for greater achievement.

STEP 4

Create Action Plan

With goals in place, the organization is now poised to develop a roadmap to improve energy performance. Successful organizations use a detailed action plan to ensure a systematic process to implement energy performance measures. Unlike the energy policy, the action plan is regularly updated, most often on an annual basis, to reflect recent achievements, changes in performance, and shifting priorities.

While the scope and scale of the action plan is often dependent on the organization, the steps below outline a basic starting point for creating a plan.

- Define technical steps and targets
- Determine roles and resources



Get buy-in from management and all organizational areas affected by the action plan before finalizing it. Work with the Energy Team to communicate the action plan to all areas of the organization.

Tip

Creating an inclusive strategy that establishes roles and actions throughout the organization can help to integrate good energy management practices. When developing an action plan, consider: Brainstorming with various departments to identify ways they can contribute, holding a competition to seek ideas for energy efficiency from across the organization, and gathering recommendations from the Energy Team and other key personnel.

Define Technical Steps and Targets

Identify gaps between current performance and goals, by reviewing the results of the technical assessments and audits or progress evaluations. Identify the steps necessary for upgrading and moving facilities from current performance to the desired level of performance as defined by the goals.

Create performance targets for each facility, department, and operation of the organization to track progress towards achieving goals. Set timelines for actions, including regular meetings among key personnel to evaluate progress, completion dates, milestones and expected outcomes.

Establish a tracking system to track and monitor the progress of action items. This system should track and measure energy use and project/program activities.

Determine Roles and Resources

Determine who should be involved and define their responsibilities. Depending on the organization and action plan, internal participants might include departments such as:

- Facility and operations management
- Financial management — capital investments, budget planning
- Human resources — staffing, training, and performance standards
- Maintenance
- Supply management — procurement procedures, energy purchasing and equipment and materials
- Building and plant design
- Engineering
- New product/process development teams
- Communications Marketing
- Environmental, Health, and Safety

External participants include consultants, service providers, vendors, and other product providers. Some organizations may choose to outsource entire aspects of their action plan while others may only want to contract with specific vendors for limited projects. If contractors will be used, determine what standards will be used to evaluate bids and incorporated these metrics into agreements with contractors.

The next step is to determine resource needs and secure the resources. For each project or program in the action plan, estimate the cost for each item in terms of both human resources and capital/expense outlay. Develop the business case for justifying and gaining funding approval for action plan projects and resources need.

Using outside help to implement parts or all of an action plan does not mean outsourcing responsibility for aspects of an energy management strategy. The other steps in the energy management strategy still need to be managed internally to ensure success and realize sustained energy performance.

STEP 5

Implement Action Plan

People can make or break an energy program. Gaining the support and cooperation of key people at different levels within the organization is an important factor for successful action plan implementation in many organizations. In addition, reaching the goals frequently depends on the awareness, commitment, and capability of the people who will implement the projects.

To implement the action plan, consider taking the following steps:

- Create a communication plan — Develop targeted information for key audiences about the energy management program.
- Raise awareness — Build support all levels of the organization for energy management initiatives and goals.
- Build capacity — Training, access to information, and transfer of successful practices, procedures, and technologies, can expand the capacity of the staff.
- Motivate — Create incentives that encourage staff to improve energy performance to achieve goals.
- Track and monitor — Using the tracking system developed as part of the action plan to track and monitor progress regularly.

Create a Communication Plan

Good communication does not just happen. It requires careful planning and implementation. To communicate strategically, identify key audiences, determine the information that they need, and adapt messages appropriately for each one.

Raise Awareness

Everyone has a role in energy management. Effective programs make employees, managers, and other key stakeholders aware of energy performance goals and initiatives, as well as their responsibility in carrying out the program. Communications strategies and materials for raising awareness of energy use, goals and impacts should be tailored to the needs of the intended audience.

Most people are unaware of how their everyday actions and activities at home and work affect energy use and impact the environment. Increasing overall awareness can be an effective way to gain greater support for energy initiatives. Increasing general awareness of energy use can be accomplished through:

- New employee orientation programs

Provide basic information on organizational and individual energy use to new employees.

- Poster campaigns

Develop attractive and informative posters for break rooms, bulletin boards, etc, that discuss energy use.

- Earth Day events

April 22nd is Earth Day and provides an appropriate context for increasing awareness of the environmental impacts from energy use and how to reduce these impacts through everyday actions at work and home.

- Intra and Internet sites

Publish information on energy use, environmental impacts, and energy-saving options geared towards a general audience on the organization's web site or intranet site.

- Pay statement mailers

Include energy-savings tips and energy efficient product information with pay statements.

- Fairs and summits

Conduct an energy fair or summit oriented towards employees with information on energy saving activities and products.

Individuals working in or even managing a facility may have little understanding of the energy performance of the facility or its impact on the organization and environment. Targeted efforts designed to increase awareness of facility energy use can help build support for energy management programs.

Like general awareness efforts, facility-oriented energy awareness can take many forms. In developing facility energy awareness programs, consider using the following types of information:

1. Summary statistics

Use general facility energy facts and figures, such as overall energy costs, costs to operate equipment, environmental information related to energy use, and so on.

2. Sources of energy

Most Americans do not know how the energy they use is generated. Providing information on the sources of energy used at the facility along with the associated pollution that results from its use could increase awareness of the environmental aspects of energy use.

3. Energy use of equipment

Provide information on the energy performance of equipment or processes that employees regularly use as part of their jobs. For example, most employees probably do not know how much energy their computer uses during the day and how much that costs the organization when it is on, but not in use.

4. Scorecards

Develop charts and graphics that illustrate energy performance across the organization or compare it to a national standard, such as the ENERGY STAR buildings rating system available through Portfolio Manager and industrial plant rating system available through industry specific Energy Performance Indicators (EPIs).

It is also important to gain management support. Frequently, managers who are not directly involved in energy management are not aware of how energy use effects the organization. Increasing the awareness of managers can help to build support for energy management initiatives.

It is important to identify key audiences such as executive management, facilities managers, operations managers, purchasing officers and procurement staff, communications and marketing staff. Tailor the information to address the chief concerns of each audience, such as cost of energy per pound of product, or cost per square foot of building space and determine the most effective way to communicate with each audience. This could range from a presentation, to a memo, or an informal meeting. Also, maintain regular contact to keep managers up-to-date on progress or changes in performance.

Build Capacity

Investing in training and systems to share successful practices helps ensure the success of the action plan by building the overall organizational capacity. Many organizations have found that informed employees are more likely to contribute ideas, operate equipment properly, and follow procedures, helping to guarantee that capital investments in energy improvements will realize their potential.

Using training to help staff understand the importance of energy performance provides the information necessary to make informed decisions. Training also provides an excellent opportunity for gathering employee feedback and evaluations. The type and nature of training will vary by organization and the specific action plan. Common training programs include:

- Operational and procedural training — Provides instruction on new operating methods or procedures designed to reduce energy use. Such training is typically targeted towards specific audiences, such as facility managers, operations, and maintenance staff.
- Administrative training — Includes reporting, monitoring, data collection, and other administrative efforts that support energy management.
- Specialized training — Gives specific instructions on using and maintaining equipment or tools to ensure more efficient operation.

Computer-based information systems provide a robust means for sharing information on best practices, technologies, and operational guidance. While these systems can range from complex databases to a simple intranet site, they are a centralized and accessible place to store and transfer energy management information within an organization.

Knowledge and management information systems are usually organization-specific. They typically include information on:

- Best practices — Catalogs successful and effective practices for energy management within an organization.
- Technologies — Contains information on known, used, or recommended technologies, equipment, lighting, HVAC, and so on.
- Procedures — Houses up-to-date information on specific procedures and operating practices.

Motivate

Offering incentives for energy management is one way many organizations create interest in energy initiatives and foster a sense of ownership among employees. Examples of how organizations motivate staff and employees include:

- Internal competition — Use tracking sheets, scorecards, etc. to compare performance of similar facilities and foster a sense of competition.

- Recognition — Highlight and reward accomplishments of individuals, departments, and facilities.
- Financial bonus and prizes — Offer cash bonuses and other rewards if goals are met.
- Environmental responsibility — Use environmental messages to promote a sense of environmental and social responsibility.
- Financial responsibility — Use financial messages to promote a sense of fiduciary responsibility.
- Performance standards — Tie employee performance standards to energy goals.

Track & Monitor

A tracking system is the means by which an energy program's activities are monitored. The system should be centralized and available for all to use in gauging progress toward established targets, milestones, and deadlines.

Maintaining a tracking system enables the Energy Team to assess necessary steps, corrective actions, and identify successes. Periodic review of the activities outlined in the action plan is critical to meet energy performance goals.

To advance the goals of the energy management program, it is important to perform regular updates, conduct periodic reviews, and identify corrective actions.

A system is only effective if the information it contains is current and comprehensive. Data needs to be collected and incorporated into the system at an interval of time effective to the program. Many organizations perform weekly and monthly updates to their tracking systems.

Periodic reviews of progress in meeting interim goals and milestones should be conducted with the management team, the energy team, and selected groups of employees. The frequency of these reviews will vary depending upon the audience. Such reviews should focus on progress made, problems encountered, and potential rewards.

A tracking system is a good way to determine whether a program is performing well. It will help identify when a specific activity is not meeting its expected performance and is in need of review.

A best practice organization is the Walt Disney Company. Walt Disney World Resorts is made up of nearly 200 buildings. To effectively track and manage energy at these facilities, Disney developed an innovative intranet-based computer program called the Utility Reporting System (URS). This system publishes utility and submetering data on Disney's intranet system and tracks the results from energy savings efforts. By publishing performance data, the URS continuously “shines a light” on utility usage at each facility and allows similar facilities to be compared to each other. Since no facility wants to be at the bottom of the list, the system helps drive continuous improvement at the facility level. Information and reports generated by the URS help Disney's energy managers identify areas that need improvement. When a facility is not performing as expected, Building Tune-up (BTU) Teams are formed from Engineering and Operations to review the building and energy management systems control devices, programming, and settings. Disney estimates that its URS has facilitated a 5–20 percent reduction in utility usage and ensures that all building systems are operating at peak energy performance.

STEP 6

Evaluate Progress

Evaluating progress includes formal review of both energy use data and the activities carried out as part of the action plan as compared to the performance goals.

Evaluation results and information gathered during the formal review process is used by many organizations to create new action plans, identify best practices, and set new performance goals. Key steps involved include:

- Measure results - Compare current performance to established goals.
- Review action plan - Understand what worked well and what didn't in order to identify best practices.



Regular evaluation of energy performance and the effectiveness of energy management initiatives will allow the energy manager to measure the effectiveness of projects and programs implemented, make informed decisions about future energy projects, reward individuals and teams for accomplishments, and document additional savings opportunities as well as non-quantifiable benefits that can be leveraged for future initiatives.

Measure Results

Gather energy use data and compare results to goals to determine accomplishments.

Key steps in measuring results include gathering tracking data and benchmarking. This includes reviewing energy use and cost data (capital and operating expenses), organizing reports and data from tracking and monitoring efforts, and analyzing energy efficiency achievements based on established performance metrics. Benchmarking may include: Comparing energy performance to baselines, comparing performance against established goals for environmental and financial savings, and comparing energy performance to peers and competitors to establish a relative understanding of where the performance ranks.

Use Portfolio Manager or the ENERGY STAR Energy Performance Indicators (EPIs) to rate the current energy performance the facility against similar facilities. If it is a new building, compare the design's target energy performance with the building's actual energy performance score.

Review Action Plan

After reviewing performance data, the next steps is to understand the factors affecting the results as well as the additional benefits of the improved energy performance.

This review should look at the effectiveness of the action plan. Where activities and projects were successful, the best practices should be documented and shared throughout the organization. Where goals were not met, many organizations determine the cause and decide what corrective or preventive actions should be taken.

Key steps in reviewing the action plan include:

- Get feedback — Solicit feedback and ideas on the plan from the energy team, implementation staff, and other departments.
- Gauge awareness — Assess changes in employee and organizational awareness of energy issues.
- Identify critical factors — Identify factors that contributed to surpassing or missing targets.
- Quantify side benefits — Identify and quantify, if possible, side benefits arising from energy management activities such as employee comfort, productivity improvement, impact on sales, reduced operation and maintenance expenses, or better public/community relations.

Action plan review involves a commitment of resources, but also has many advantages. It creates insight for new actions (technologies/practices/programs), avoids repeating failures by identifying activities that were not as effective as expected, assesses the usefulness of the tracking system and other administrative tools to ensure better management and evaluation, provides staff the opportunity to contribute to and understand the process of energy management, and provides specific success stories and financial results to communicate to stakeholders inside and outside the organization.

STEP 7

Recognize Achievements

Providing and seeking recognition for energy management achievements is a proven step for sustaining momentum and support for the program. Providing recognition to those who helped the organization achieve these results motivates staff and employees and brings positive exposure to the energy management program. Receiving recognition from outside sources validates the importance of the energy management program to both internal and external stakeholders, and provides positive exposure for the organization as a whole.



Key steps in providing and gaining recognition include:

- Providing internal recognition — to individuals, teams, and facilities within the organization.
- Receiving external recognition — from government agencies, the media, and other third party organizations that reward achievement.

Recognizing ENERGY STAR Award Winners

In 2006, EPA recognized seven ENERGY STAR partners for their leadership in energy management and six others for their sustained excellence in this category. Four ENERGY STAR service and product provider partners were also recognized for their contributions. To help publicize the achievements of ENERGY STAR Award winners in all categories, EPA developed a full-page, color public service announcement (PSA) which ran in major publications such as *Entrepreneur*, *Money* and *US News & World Report*. The PSA was also shared with local and trade publications.

Partners are also encouraged to promote this notable achievement internally and externally through newsletters and local media.

Providing Internal Recognition

Recognizing the accomplishments of individuals and teams is key to sustaining support and momentum for energy management initiatives. Rewarding particular efforts sets the example for what constitutes success and helps motivate employees through increased job satisfaction. Recognition can strengthen the morale of everyone involved in energy management.

The decision about who should receive recognition in the organization will likely be shaped by the purpose for providing recognition and the organizational culture. Common recognition levels include:

- Individual — Acknowledges the contributions and accomplishments of specific people.
- Teams — Recognizes the achievements of teams, departments, and other distinct groups within the organization.
- Facility — Rewards the accomplishments or performance of an entire facility.

Create criteria for recognition and communicate these criteria and any process eligibility requirements. Recognition criteria might include thresholds of achievement such as: Offered the best energy savings ideas, achieved the greatest energy use reduction, or increased savings by “X” amount.

There are a variety of ways to provide recognition and rewards. Depending on the purpose of the recognition program and the organizational culture, forms of recognition can range from formal acknowledgements and certificates, to salary increases and cash bonuses, to simple forms of appreciation such as coffee mugs or energy program shirts.

Tip

Ask senior management to provide the recognition. Use a formal means for providing recognition, such as an award ceremony. Use progress evaluations to inform the recognition process.

Receiving External Recognition

Good work deserves to be acknowledged. Recognition from a third party can provide validation for an organization's energy management program. Not only does it provide satisfaction to those involved in earning the recognition, but it can also enhance an organization's public image. A solid reputation contributes to the competitive advantage by making the organization more attractive to customers, students, current and potential employees, lenders, business partners and other stakeholders.

Before seeking recognition from external groups, it may be best to determine the most appropriate avenues to pursue. A few ways to gain recognition for the organization's energy management efforts may be: Partnership programs, performance standards, achievement awards, or public reporting.

Participate in established groups, such as government agencies, trade associations, or regional energy conservation groups to demonstrate commitment to achieve results. Meet widely recognized standards of performance, that reflect superior performance. Surpass a variety of predetermined criteria, often both qualitative and quantitative, that identify superior energy management programs. Report progress publicly and to targeted stakeholders that monitor and critique energy performance to gain their support or good will.

There are a variety of government programs, industry associations, and other organizations that recognize environmental achievements through energy management. These include: Professional associations, trade associations, and non-profit organizations.

Summary

Whether a business is in manufacturing, real estate, retail, healthcare, education or government, controlling and cutting costs is important for success. Reducing energy use and increasing energy efficiency is a proven strategy for cutting and controlling costs with good returns.

The seven steps presented in this course are a good outline of how to develop an energy management program. The steps are,

1. Make a Commitment
2. Assess Performance
3. Set Goals
4. Create an Action Plan
5. Implement the Plan
6. Evaluate Progress
7. Recognized Achievements

Organizations that have adopted effective energy management strategies, such as presented in this course, and built successful energy programs have had excellent results. In addition, the value of strong energy management as a proxy for overall organizational management is increasingly recognized by financial analysts.

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