

SEVEN REASONS FOR ENERGY ACCOUNTING

Before you can manage energy costs, you have to know what they are! Energy accounting provides feedback on how much energy your organization uses, and how much it costs. It also provides a means to effectively communicate energy data that facility staff, building occupants and managers can use to improve cost management. Energy accounting will help your organization:

Record and attribute energy consumption and costs.

Energy costs depend on the amount consumed and its price. In an organization with many facilities, energy accounting makes it possible to compare energy use and cost among facilities and to monitor how energy use changes over time.

Troubleshoot energy problems and billing errors.

By consistently tracking energy use, you can identify problems. A sudden unexplained increase in consumption, for instance, means it's time to investigate the site for the cause.

Provide a basis for prioritizing energy capital investments.

Find out which facilities have the highest energy costs, and consider targeting them for energy retrofits or other energy management efforts.

Evaluate energy program success and communicate results.

Did you save what you thought you would from your energy management efforts? How did the actual dollar savings from your lighting or HVAC retrofit compare to the savings predicted by your vendor or contractor? Without energy accounting, it's virtually impossible to answer these questions. Once you determine the results of energy management activities, it's important to communicate this information to decision makers and implementers who were responsible for the activities. Energy accounting reports and graphs are the tools for this important feedback.

Create incentives for energy management.

It's often difficult to get anyone in an organization to take the time and responsibility required for carrying out energy management activities because there is little incentive to take on the task. A maintenance director or site manager may not see much benefit in reducing energy costs if all of the savings revert to the general fund, or if lower energy bills only result in smaller allocations for utility costs in next year's budget.

Budget more accurately.

Energy accounting gives a historical look at costs that will help you budget more realistically for the future.

GOALS

- Manage energy costs
- Promote energy/environmental awareness
- Manage water and other resource costs

OBJECTIVES

- Verify savings from energy retrofits
- Motivate staff to manage energy costs
- Set energy cost savings goals and monetary incentives
- Prioritize sites for energy retrofits
- Troubleshoot unusual consumption increases
- Find billing errors
- Prepare to negotiate for price and service as electricity undergoes deregulation

Consider a system of communication.

What kinds of reports and graphs will be needed, and by whom? When and how will information be reported? Make sure you get the right information to the right people, at the right time.

Consider what tools (including software) you will need for an energy accounting system.

Based on your organization's needs and constraints, what kind of energy tracking software (if any) will you purchase?

Obtain necessary data.

The information you collect will depend on the level of detail you wish to track and on the type of system and/or software you will use.

WHAT CAUSES VARIATIONS IN ENERGY USE?

Before considering what methods and means of energy accounting will best serve your organization, it is important to look at what causes building energy use to vary. These are some of the major factors:

Weather.

Energy used for heating and cooling varies as a result of changing temperatures.

Only a portion of a building's total energy is weather dependent. While energy use for cooling or heating (chillers, boilers, heat pumps, and use of some fans) is weather dependent, for example, lighting, office equipment, and ventilation energy use is not.

Building area changes.

Changes in building size will also strongly influence energy consumption. If square footage is added to a facility, energy use can be expected to increase. Most energy accounting software can correct for changes in building area by assuming that energy use will increase (or decrease) proportionately to square footage. Some software programs can account for non-proportional changes by adding or subtracting a fixed amount or percentage to the baseline consumption for each month.

Operations and schedule changes.

Changes in building occupancy or schedules for building and equipment operation will affect energy use. If a building is open longer, more energy will be used for heating, cooling, and lighting. If a school cafeteria brings in pre-cooked meals in disposable containers instead of doing local cooking and dishwashing, kitchen energy use will be reduced.

Changes in building equipment.

When new equipment is added or existing heating, cooling, ventilation, hot water, lighting, or other energy using equipment is replaced, modified, or abandoned, energy consumption will change. Energy accounting can document savings due to energy efficiency retrofits, or other changes in equipment.

METHODS OF ENERGY ACCOUNTING

There are several ways to compare information that will affect how you choose to track energy data for your organization. Three methods that vary in how they account for changes in weather are explained in the following paragraphs.

Present-to-past comparison.

This is the simplest method of comparing energy use, requiring only monthly utility bill data. In this method, energy usage for a given period — a month, quarter, year, or other period — is compared with the same period of the previous year or a base year.

Multiple year monthly average.

This method gives a more accurate reflection of historical heating and cooling usage than the present-to-past comparison, especially if other factors such as square footage and hours of equipment operation have remained constant.

Temperature corrected method — heating degree days/cooling degree days.

Because most building energy use is affected by weather, this method will most accurately reflect energy savings due to changes in building equipment or energy management.

MEANS OF ENERGY ACCOUNTING

Energy accounting can be done manually, on computerized spreadsheets, or with dedicated software. There is no single “right choice” of what method to use — the best method depends on the characteristics of your organization, what you want to track, and how you plan to communicate your energy accounting data.

Manual Energy Accounting.

For a small organization such as a single elementary school, a manual worksheet to record monthly energy bills may be sufficient.

Energy Accounting Using A Spreadsheet.

One step up from manual energy accounting is using a computer spreadsheet program (like Excel or Lotus) to track energy expenses. The spreadsheet can record the same information as a manual system and automatically calculate energy use per day, energy use per square foot, or energy use per square foot per HDD. Spreadsheets also provide graphing capabilities.

Commercial Energy Accounting Software.

For large organizations with many facilities, it makes sense to consider purchasing commercial energy accounting software.

Energy accounting software makes it easier to enter or import data, provides ready-made reports, and calculates corrections for some factors that affect energy use. Energy accounting software generally incorporates weather and square footage corrections, and will pro-rate energy garbage, sewer, and recycling.

Energy Accounting as a Service

Some utilities and energy consultants will provide energy accounting services to your organization for a fee.

FEATURES OF ENERGY ACCOUNTING SOFTWARE

Because software varies in terms of complexity, user friendliness, application and cost, comparing different programs can be challenging. A good start is examining the following basic features found in virtually all software:

- Organization/Site Records
- Billing and Climate Records
- Reports and Graphs
- User Friendliness
- Documentation and Support

Organization/Site Records.

Each software program must record basic site information, including the name of the site, its address, and associated accounts and meters.

Billing and Climate Records.

All of the reviewed commercial software programs record total monthly energy consumption and cost based on monthly utility bills for each fuel. All allow at least some additional detail, such as

recording and breaking out the cost of electrical demand, different charges for different times of use, and power factor charges from electricity bills.

An executive summary of the organization as a whole.

Ideally this report should be no longer than a few pages and should show at a glance the performance of major departments and the entire organization, including dollar savings.

Reports or graphs with this information are critical in providing administrators with easy to understand information on your energy management efforts.

Monthly direct side-by-side comparison of current energy use to base line or previous year's use for each site.

This kind of report or graph allows you to note changes in energy use patterns that result from operational changes, equipment failures, retrofits or other factors. A 2-year comparison graph provides an easy way to track progress in reducing costs, or to spot problems at individual sites.

Calculations of comparison parameters.

These can include the percentage change in fuel use, dollar cost per square foot, total BTUs per square foot, and actual fuel use in therms or kWh per square foot. These parameters make it easier to compare similar buildings. Depending on how you will use your data, the most appropriate parameters may vary. Percent of change is useful because goals are often set in these terms. Cost information is more meaningful to most people than kwh and BTUs.

Graphs.

Visual presentation of data usually is more effective in getting the point across. Many energy accounting software programs now have the capability of attractively formatted color graphs.

Most energy accounting suppliers will provide you with a trial copy of the software. As you review software for possible purchase, consider the data entry methods, and review many of the standard reports. Try customizing reports or creating user-defined reports. Check to see if they will meet your organization's needs for both content and presentation format.

User Friendliness.

Most of the main energy accounting software programs are Windows-based. There are a variety of procedures for entering data, creating reports and graphs, and flagging possible errors.

Documentation and Support.

Documentation should, at a minimum, explain each entry screen or window and menu option, and preferably show the screen image. A glossary or explanation of specialized terms in the text will be helpful, as will on-line help.

TIPS ON SELECTING SOFTWARE

Know Your Applications and Needs.

Develop a clear idea of your specific software needs and applications. Although you may be tempted to skip planning and get on with the program, the more you know your applications, the more successful your software selection will be. Many organizations have found it advantageous to essentially set up the energy accounting system on paper before purchasing software.

Examine Software Demos and Documentation.

Examine a demo version of the software, look through the user manual and sample the reports prior to purchase. Most suppliers will provide a demo or trial version with a limited life or with some aspects disabled. Read enough of the documentation and use the demo or tutorial enough to know how different functions work. Get a feel for the user-friendliness of the software.

Talk to Users of the Software.

Experienced users can provide a wealth of frank information and could save you from making a costly mistake. Ask the supplier for references of other users with applications similar to your own and get their opinion. What do they like, and what would they want to change about the software? How much time did it take to set up the system? Would they buy it again?

Know What Support you are Buying.

Understand the level of support you are buying with the software. Will you have ready access to assistance over the telephone? Is training available, and if so, at what cost? Will you receive free or low-cost updates of newer versions? Are services such as on-line weather data and utility rate schedules available? Will the software company assist you in importing available electronic billing information? If so, at what cost?

You may wish to consider contracting with your software supplier or other consultants to set up and run your energy accounting system for you. Even if you have a consultant run your system, however, interpretation of the data will require specific site knowledge available only within your organization.

Don't Compromise on Important Features.

Obtain the best software for your needs. Compromising on essential features or ease of use to save money is often unwise in the long term. A much larger investment of staff time will be required to set up and maintain the system than the initial cost of the software.

SUMMARY OF ENERGY ACCOUNTING

Energy accounting can help your organization understand how energy is used and can help motivate people to take actions that can result in significant utility cost savings. However, many organizations do not realize the full benefit of tracking energy consumption and cost.

The biggest pitfalls that keep organizations from effectively using energy accounting data are:

- Lack of staff time and commitment in maintaining the system.
- Failure to communicate the results to the right people.

To make the most of energy accounting, it is crucial to allocate sufficient staff time for setting up and maintaining the system, and to develop a system of communication with administrators, facilities staff, and others whose decisions affect energy use.

Energy accounting by itself will not save energy. But when used as a tool of energy management, it can help you make changes in operations or equipment that save energy dollars. Energy accounting can also help in budgeting, allocating resources for capital investment, and verifying the results of all of your energy management activities.

Reference:

http://www.energy.ca.gov/reports/efficiency_handbooks/400-00-001B.PDF