

## ENERGY MATTERS: The First Step in Developing a Sustainability Program



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# Introduction

Sustainability has been the focus of many organizations trying to improve their triple bottom line (Profit, people, planet). In many organizations, profit and people are developed goals but now planet is taking center stage. Organizations are realizing that sustainability programs are not only good for the environment and stewardship but can increase profits.

Many facility managers struggle with what a sustainability program is and how to implement one. Sustainability is a catch all that touches on many things including energy management, water conservation, emissions, and hazardous waste. Since sustainability covers many areas, it is important to start with a single activity and scale the program from there.

While having a positive impact on the environment is an organizational goal, demonstrating a return on investment will get projects approved and build momentum. One area of sustainability that can demonstrate ROI is an Energy Program. Not only can you build momentum by demonstrating ROI, an Energy Program can quickly be put into motion. This is because most of the information needed for analysis is available. It simply needs to be aggregated in a management tool. Coupled with analysis of current information are government and industry organizations that provide benchmark information for creating a baseline for comparison.

So, what is an Energy Program? An energy program is an analysis of your current energy use, benchmarking that against industry standards, and developing goals for smarter energy choices. The purpose of this document is to

- Outline how to start an Energy Program
- Provide an overview of industry tools for education, support, and benchmarking
- Discuss management tools to support an Energy Programs
- Illustrate costs and benefits

# How to Start an Energy Program

There is no difference when an organization evaluates an Energy Program to any other type of program. The process remains the same. It takes commitment, goals, planning, and evaluation to succeed. To avoid being overwhelmed, start with the core information needed to establish a baseline for energy use and costs. Take your first step by assessing the available information and the state of your energy program.

## Assessment

We recommend starting with an Energy Program because of the availability of the data to support a program. This is the first step in the assessment if a program exists. Begin asking questions within the organization.

- Is there an Energy Program in place?
- Has a role been established to create this program?
- Where can I find the data?
- Are there tools in place to manage a program like this?

What we find, is that many groups are capturing their information but no one is aggregating and making decisions about their facilities energy use. The financial officers are looking at year to year budgets and if it is within certain percentages, it is approved. The space planners or real estate office, store and house facility information including the building list and square footage. The maintenance manager inventories the operational and equipment information.

In most cases, implementing an Energy Program becomes a supplemental role for facility managers. Sustainability merges into their responsibilities as they maintain their facilities and work with other groups to centralize their information.

The second step is to access and determine what data is available and required, find the source, and who is responsible for it. This is incorporated into the "Phase 1 - Plan" to start the basis of a phased energy plan.

It is beneficial to understand what core data will be needed to start developing a baseline of information. Below is a good starting point.

- Energy use and cost
- Facility information (including building, floor, and room identifier)
- Facility size: square footage/meters  
Size by department
- Organizational information (including division and department)
- Account information (including chart of accounts, cost classifications, bill types & units)
- Vendor information (utility companies)
- Employee information (including name, contact information, location, and department assignment)

After determining what data is needed, it is important to identify where and who is responsible for the data.

- Energy use and cost: *utility companies, building automation systems, or spreadsheets*
- Facility information: *facility management system - can usually provide how the space is being used.*
- Facility size: *facility management system - can provide square footage/meters by use. (i.e. Accounting = XXXX ft squared)*
- Organization information: *financial or human resource system*
- Account information: *financial system, utility companies*
- Vendor information: *financial system*

- Employee information: *human resource system, directory system*

## Phase 1 - Plans & Goals

Goals enable an evaluation of the program. A plan will get you to your goals. You want to define and document the plan and goals before you start your program. This can take anywhere from 25 - 40 hours. Listed are some elements that will contribute to creating a successful plan:

- Establish a historical baseline - where is the make up of my information today?
- Document an inventory - what building or equipment will I start with?
- Build a schedule - what time is needed to implement in a phased approach?
- Research the best options - what tools will I use to aggregate and track the data?
- Organize information and staff - what data is needed and who is going to maintain it?
- Formulate a maintenance plan - how am I going to assess the program?
- Strategize to spread the word - what methods can I use to raise awareness?

It is pivotal to set realistic goals and set a schedule for evaluation. Many organizations first choose to organize their energy information to establish a baseline of use. Typically, a twenty-four month period allows for accurate comparisons and gives the probability of the year-to-year collation of use.

Another way to demonstrate quick results is to aggregate energy use by building and divide that by the square footage to get the cost/square foot. This can be used as a benchmark. The energy use can be further broken down to get each department's total energy costs and costs per square foot. Establishing this background information will allow loftier results as you enter into the "Phase 2" of your planning and goals. Though most information is recorded and available, it takes time to aggregate, develop maintenance processes, and create reports for the evaluation. Realistically, a standard time frame to accomplish may take up to six months.

Most commonly, a typical pitfall is being too aggressive with the implementation timeline and the goals. Since organizing your information is the foundation of the program, it is important to have an accurate, useful data set to build on. Many organizations do not take into account that attaining success in these programs requires time and attention outside of regular duties. We recommend that doubling the estimate is usually a safe bet. An integral reason why it is beneficial to work with a vendor to set proper expectations. One of their primary tasks is to assist with developing the plan, schedule, expectations, challenges, and selecting the management tools. By establishing realistic short term goals to build upon, long term goals materialize because the information being analyzed will be based on a well thought out plan.

## Phase 2 - Plans & Goals

Now that the short term goals have been achieved, you can start to grow your energy program with longer term goals. Long term goals will differ by organization. Building on your short term plan, continues to develop and document goals that make sense for your organization's mission. Below are examples of long term strategies for your Energy Programs:

- Lower annual energy costs by setting energy reductions goals.
- Reduce carbon footprint
- Gain tax benefits
- Recognize high cost facilities
- Evaluate and compare consumption among buildings
- Mitigate risk of rising energy costs
- Identify utility bill errors
- Track energy use trends over time
- Discern areas to focus on improvements (utility type, location)
- Grow portfolio certification including LEED, Energy Star, etc

Examples of tactical ways to see long term strategies transpire:

- Lower energy costs by rightsizing your space. Review the space layouts and set square footage based on employee role. Group employees in a way to maximize space use
- Install retrofit lighting
- Create awareness campaigns to turn lights and computers off
- Conduct changes in Heating, Ventilation, and Air Conditioning (HVAC) systems and controls
- Group space where you can reduce temperatures i.e storage
- Increase proactive maintenance of equipment including calibration
- Evaluate hotelling option. Determine if it makes sense for a portion of your work force to have home offices
- Lock into rates with energy companies
- Review bills for errors
- Gain tax benefits. Receive reductions if your tax/sq. foot meets the ASHRA energy consumption standards

## Industry Tools

There are industry tools from EPA that will help in rating the current performance of your portfolio as well, establishing a baseline against similar portfolios. They provide a good starting point when assessing your energy use. Often, it is difficult to know how your portfolio stacks up against other competing/similar portfolios. Once you have an established baseline and all your information is collected, you can use this tool to help you understand how your facilities compare to other like facilities. An increasingly popular place to get such information is the EPA. The primary EPA tool that assists facility managers is Energy Star. Energy Star shares a standard for energy efficient building and provides many tools that are needed to evaluate your facilities. Energy Star's functions include:

- Guidelines for an Energy program: General tasks for starting a program
- Facility Energy Assessment Matrix: Spreadsheet that asks questions to let you understand where your program stands
- Portfolio Manager: You can input your facility characteristics for a rating of 1-100. For example, if you scored a 75, that means your facility is more efficient than 75% of other facilities that have similar characteristics. If your facility scored a 75 or higher, it qualifies for the Energy Star certifications. The Portfolio Manager uses an algorithm to account for different energy sources, whether it be gas or electricity, as well tracks your energy sources if they are produced on premise or received from the grid. Portfolio Manager will give you a listing of buildings equivalent to yours and will provide consumption levels to establish baselines for comparison. These can help with your Phase 2 goals for energy reduction.

Energy Star segments facilities by facility type. Currently, it's facility types cover:

- Government
- Healthcare
- Higher education
- Hospitality/entertainment
- Industrial
- K-12
- Real estate/multi family
- Retail
- Small business

- Congregations
- Service and product providers
- Utilities and energy
- Efficiency program sponsors
- Water / waste water utilities

## Management Tools

While Energy Star is a good starting point for developing a Energy Program, a management tool is essential to the ongoing maintenance and evaluation of your energy program. A management tool is the operational tool used on a day to day basis to combine your data in order to make decisions. From our experience, we recommend an integrated tool - a tool that infuses and collaborates already captured and stored facility information from varying systems. Integrated Workplace Management Systems (IWMS) is an industry acronym that encompasses combinations of these types of systems. An IWMS is an enterprise platform that integrates five key components of functionality, real estate management, project management, facilities and space management, maintenance management, and **environmental sustainability**. Ultimately, the reason these functions can be included in one program is because the systems are role based. Role based systems allow for only the user to see and manage the information relative to them, while still benefiting from data that may be captured from other groups. Role based systems allow for only the user to see and manage the information relative to them, while still benefiting from data that may be captured from other groups. Role based systems allow for only the user to see and manage the information relative to them, while still benefiting from data that may be captured from other groups. You can expand from other facility areas like space planning, work order management, move management, lease management, project management, or you can start with the Energy Module and grow from there. Another benefit of these systems, are the modules they provide for other sustainability goals. Including:

- Water reduction programs
- Carbon emission reduction programs
- Hazardous material tracking, disposal, and compliance

Tools that IWMS provide can be profitable integrations to other systems. Typically, these other systems are less successful individually because the data to support the program must be entered manually. This is time consuming and can result with many errors. The IWMS integration coherently unites with other databases , imports spreadsheets with ease and has the breadth to connect various systems through multiple methods.

A good example of an effective integration is with Energy Star's Portfolio Manager. Even though using the Portfolio Manager to rank your facilities and provide comparable properties is a great service, having to manually enter your portfolio is time consuming and could potentially derail part of your program. Since an IWMS captures much of the information Portfolio Manager needs, the information can be exported into spreadsheet templates and smoothly imported into Portfolio Manager. After the ranking is calculated and the list of comparable buildings is provided, the updated information can be imported back to the IWMS for benchmarking and auditing purposes for compliance and certification.

Here at Idisis, we implement ARCHIBUS as our preferred IWMS. ARCHIBUS is designed as an integrated real estate, infrastructure and facilities management solution to address the needs of multiple functions and departments in your organization. Our comprehensive, industry-leading applications provide the visualization, planning, analysis, and reporting tools that deliver superior, operational insight and cost control. These results ensure more efficient management of assets and people, and enhance customer service that advances an overall organizational productivity.

ARCHIBUS provides the following applications:

- Real Estate Portfolio Management

- Capital Project Management
- Space Planning & Management
- Move Management
- Asset Management
- **Environmental Sustainability & Risk Management**
- Building Operations

## Cost & Return on Investment

Cost and return on your investments are a vital part of an energy program and should not be ignored. When evaluating any program, the costs and benefits mirror the same planning as the program itself. Since an energy program does not increase revenue, the return should be exhibited from a reduction in costs.

### Costs

Starting with an Energy Program will grant quick deployment at reasonable costs leading to an accelerated return on your investment. Primarily, your costs root from human capital costs and the management tool your organization operates with.

**Human Capital Costs** = Labor Hours X (Hourly Wage Rate X 1.3\*)

\*Employee benefit burden is ~30% of wage

**Management Tool (IWMS)** = (One Time Software Costs + One Time Service Costs) + (Ongoing Software Costs + Ongoing Service Costs)

#### One Time Software Costs

- Concurrent license: Most systems sell you licences based on concurrent users. This is the maximum amount of user logged in simultaneously. Licenses are usually sold in blocks.
- Module costs: An energy specific module is sold in addition to the user licenses

#### One Time Service Costs

- Scope development (Plans): 25 - 40 hours
- Installation: 8 - 16 hours
- Configuration: 40 - 80 hours
  - Workflow
  - Security
  - Screen layout
  - Reports
- Integrations to other systems (more than once): 40 -80 hours per integration
- Data migration from other (one time): 40 - 80 hours
- Training: 16 - 25 hours
- Project Management: 20% of service costs
- Documentation: 10% of service costs

#### On Going Software Costs

- Subscription for software: This entitles you to the latest releases of the software. It is a yearly fee that is a percentage of software value. It is typically in the 16 - 18% range.

## On Going Service Costs

- Support: Technical and procedural: Support covers phone and email support. It is a yearly fee that is a percentage of software value. It is typically in the the 15 - 17% range.

Other costs to consider when undertaking an Energy Program are retrofitting, renovation, and equipment replacement costs. Time and necessary material would need to be evaluated the same way as the human capital and management. Since many goals do not initially focus on retrofitting or replacement, they were not included in the previous examples. The same process for determining the return on investment could be used for any additional costs.

## Return on Investment (ROI)

ROI can be calculated in many different ways. Organizations usually have prescribed methods for evaluating projects. Review and simulate those methods to evaluate the proposed costs for your Energy Program. We will provide an example of:

- Payback Period

Other measures used are:

- Net Present Value
- Internal Rate of Return

### Example 1:

#### Goal:

- Resize space to allow for
  - 10% of workforce to work remotely
  - 5% reduction in standard employee space
- Reduce energy costs by 5%

#### Building Description:

Square Feet: 500,000

Energy Cost/Square Foot: \$2.50

Number of Employees = 1000

Average Square Footage/Employee = 500

#### Costs of Energy:

Current Energy Costs:  $1000 \times 500 \times 2.50 = \$1,250,000/\text{year}$

#### Reductions Goals:

10% of workforce to work remotely = 900 employees

5% reduction in standard employee space = 475 square feet

5% reduction in energy costs: \$2.375 per square foot

Project Energy Costs:  $900 \times 475 \times \$2.375 = \$1,015,312.50/\text{year}$

First Year Savings:  $\$1,250,000 - \$1,015,312.50 = \$234,687.50/\text{year}$

Redeploy remaining 72,500 square feet in a more energy productive way

## Energy Program Costs

### Internal Human Capital

- Internal human capital for planning\*: 120 hours X \$37.50 = \$4,500
- Internal human capital for on going administration and analysis\*\*: 60 hours X 37.50 = \$2,250

\*Based on estimated \$60,000/year, 1 person with a 30% company overhead burden

\*\*Based on first 12 months

### Management Tool

- One time software costs: \$20,000
- One time service cost: \$40,000
- On going software costs: \$4,000
- On going service costs: \$4,000

Total first year costs: \$74,750

### Payback Period

Payback period is the amount of time a project will take to repay the initial investment.

Initial Payment for Program: \$74,750

Savings per month: \$19,557.29

Payback Period: 3.82 months ( $\$74,750 / \$19,557.29$ )

Add back the first 6 months during initial implementation where no cost savings were realized: The payback period is 9.82 months plus additional space for more productive use.