



SMART THINKING:

12 Steps Forward to Reducing Energy Consumption at Colleges and Universities

HE ENERGY STRATEGY: WHITE PAPER

Introduction

In a time when the word “energy” brings to mind rising prices or images of a natural treasure filling up with oil from an offshore disaster, there is a place where energy can be perceived with hope: the nation’s colleges and universities.

Examining the Study

For most organizations, the cost of energy is outpacing all other variable costs. For example, the cost of natural gas increased over 250 percent from 1993 to 2006; the cost of fuels and power increased over 110 percent during the same period; and the bulk of the increase (81%) occurred over the last four years.¹

The nation’s higher education institutions spend almost \$14 billion annually on energy. The implementation of sound energy management strategies can reduce energy bills by 30 percent or more.²

Further, colleges and universities are recognizing that students and employees expect them to be an active part of the global energy sustainability solution. Doing so not only supports the environment and saves money— it attracts the best students and staff.

Despite the compelling reasons to act and clear momentum in the higher education sector, many colleges and universities find that implementing an energy program is a difficult challenge. Why? In many cases, the answer is simply, no one knows where to begin.

Getting Started

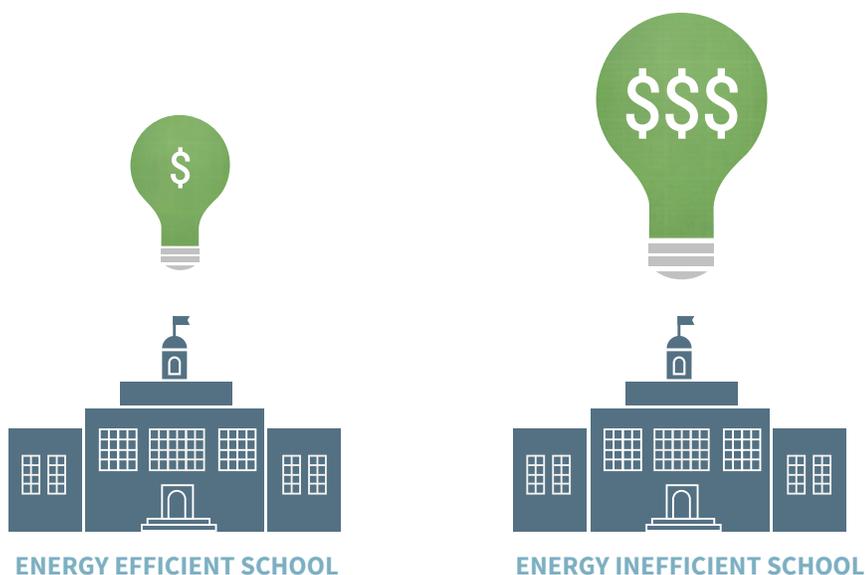
The fact is an organization can begin almost anywhere — from retrofits to behavioral programs. But everyone must begin with a baseline. If your college or university wants to save energy, it's important that everyone become aware of the energy consumption they are responsible for. Simple changes in people's behavior can quickly lead to significant energy savings, but such changes will only happen if people are aware of the energy consumption they have the power to control. Education is key. There are numerous programs that can help with these initiatives such as Clear Air - Cool Planet, ENERGYSTAR and Need.org.

In his book *“Energy Management as a Corporate Strategy”*, author Steven Hanawalt² writes about an excellent way to frame the energy improvement opportunity — begin by asking three simple questions for each energy asset:

- *What Is?*
- *What Should Be?*
- *What Could Be?*

“What Is” means understanding current energy consumption— establishing a baseline to measure improvement against. “What Should Be” means understanding the design level performance of energy assets on hand. And “What Could Be” defines the optimally run enterprise.¹

EFFICIENT VS INEFFICIENT SCHOOLS



Energy-inefficient schools use up to **three times more energy** than energy-efficient ones.

“There are some things that I believe are universal for us all regardless of institution— the first being we live in an environment of increasingly scarce resources,” says Roger Young, principal at Roger Young & Associates, an Andover, MA-based consultant to the education industry. “There isn’t a day that goes by when we’re not reminded of our financial— our budgetary— resources and how tight they are.” Every dollar spent on energy impacts teaching and learning because it takes economic vitality away from that core mission.

This should also be a motivating factor in getting started.

Twelve Steps Forward

While each higher educational institution is unique, the following actions are compiled from best practices for developing and implementing an effective energy conservation program in any educational organization.

1. Appoint an Energy Manager

Energy programs need a strong and official advocate. This person, the Energy Manager, should have a global understanding of the institution, especially the maintenance and operations areas, including ASHRAE standards, air quality standards, etc.

It is the Energy Manager’s task to gather, compile, develop, and ultimately “own” accountability for the energy plan. He or she sets goals, tracks progress, and promotes the energy management program.

This is not to say that a special staff position needs to be created for the role— many smaller institutions will look to existing staff as possible Energy Managers—but the fact is that the profile of this role is clearly rising.

Tom Raftery, lead analyst of GreenMonk, the energy and sustainability practice of Seattle, WA-based industry analyst corporation RedMonk, says that the Energy Manager represents an increasingly prominent role in most organizations.

“I foresee the rise of the Energy Manager,” he says. “With the increasing regulatory landscape around carbon emissions, carbon management and reporting will become mandatory for most organizations. In that environment, having someone specialized in energy management will start to seem like a very good idea.”³

2. Establish Benchmarks

To know “What Is”, a baseline is needed before anything else. When considering your energy data bear three things in mind:

- a) **Accuracy is critical.** Make certain that all utility bills (i.e., electric, water, gas, propane, etc.) are compiled and input accurately.

TWELVE STEPS FORWARD:

1. Appoint an Energy Manager
2. Establish Benchmarks
3. Develop the Plan & Policy
4. Determine Measurable Goals
5. Seek a Line Item in the Budget
6. Get Buy-In
7. Make it Relevant & Transparent
8. Involve Everyone!
9. Focus on Behavioral Changes
10. Implement Quick Fixes
11. Plan for the Long Term
12. Celebrate Success

- b) **Timeliness is important.** Data should be collected at monthly intervals, allowing reports to be pulled on a granular basis for better visibility and understanding of trends.
- c) **Metrics must be comparable.** Think about the metrics you will employ, and be consistent in implementation. Don't compare energy per square foot in one instance and energy per student in another.

With quality benchmark data, colleges and universities can draw better conclusions about the paths to efficient energy management.

3. Develop the Plan— Establish an Energy Policy

With the establishment of accurate benchmark metrics, energy policies can be developed and conservation plans put into place. New policies may include things like favoring communal cooking areas for faculty and students over the practice of individual refrigerators in offices or dorm rooms. Critical here is establishing awareness among users regarding what these assets cost in terms of dollars. Give individuals the knowledge to drive change and empower them to make choices. The goal here is to build possible savings into the plan, then “sell” the merits of the plan over time. An energy policy could also include elements such as:

- *Staging guidelines*
- *Appliance and vending machine regulations*
- *Equipment operating procedures*
- *Facility maintenance, upgrade, and renewal recommendations*
- *Utility peak load, usage, and conservation guidelines*

4. Determine Measurable Goals

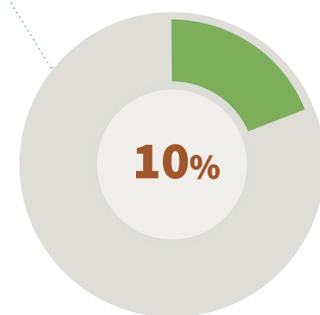
The goals of an energy plan will depend entirely upon the institution. Successful plans are often implemented in phases, with reasonable goals set for each phase. Keep immediate goals modest: early success will help create and sustain momentum. Be certain that goals are based on measurable metrics— choose a percentage reduction in a simple electrical metric based off current energy bills, or choose a metric that is a direct result of a change in staging policy.

“The University of Cincinnati **reduced its greenhouse gas emissions by over 10 percent in four years** with such projects as utility system upgrades, changing temperature set points, insulating steam valves and replacing light fixtures. An example of phased planning with reasonable goals, these and other projects have saved the university over \$10 Million.

5. Seek a Line Item in the Budget

Best practice recommendations state that an energy plan must include a budget element.⁴ Sometimes it costs money to save money, as in the case of upgrades or replacement equipment that will reduce consumption. An energy plan without this component will be unable to effect any real change. Making the energy plan a line item in the budget will also raise its profile with the administration. An energy manager must embrace this fact and be prepared to report on plan progress on a regular basis.

UNIVERSITY OF CINCINNATI



**REDUCED GREENHOUSE
GAS EMISSIONS**
(IN 4 YEARS)

6. Get Buy-in from the Administration and the Institution at Large

Any successful initiative needs buy-in from above and below. The path to buy-in from executive leadership is by reporting and building the plan from the top down.

However, you must implement the plan from the bottom up. Individuals on campus who must change their behavior need to be educated about the real stakes involved: the environment, money, the quality of education and campus life. By providing choices and the opportunity to get involved, you get everyone to take ownership of the plan.

7. Make the Plan Relevant— and Transparent

What does 10% savings in energy consumption mean to you? Without context—without relevancy— probably not much. But if that 10% is translated into a new custodian or security staff, that 10% is made real. The institution can better rally around these less abstract elements.

If the institution is involved in the plan, they want to know how it is working; so the plan should be transparent. Transparency means everyone has access to the metrics being measured to better understand the progress being made toward energy goals. The institution should publish its benchmarks and progress on a regular basis— such transparency helps achieve the goal of universal involvement across the community.

8. Involve Everyone

If students believe in the cause, students will get involved. So will teaching staff and other faculty members. More people can be drawn into the energy management program through active training and education. Involving everyone affiliated with the college or university will translate to greater achievements.

The College Sustainability Report Card¹ notes how student involvement is being encouraged by colleges and universities:

- ▶ **More than two in three schools have introduced sustainability into student orientation.**
A sustainability awareness/educational component has been integrated into an impressive 69 percent of new-student orientation programs for incoming students.
- ▶ **Nearly two in five schools have student representation on their board of trustees.**
Capitalizing on this communication opportunity can increase student awareness and involvement in energy initiatives.
- ▶ **Two-thirds of the schools offer paid sustainability opportunities for students.**
Sixty-eight percent of the schools offer paid positions to students for work on sustainability activities within the facilities department, sustainability office, or other relevant campus office.
- ▶ **More than two in five schools have a green residence.**
A green dorm that features green building best practices and/or a dedicated green residence for eco-minded students is offered by 42 percent of the schools.
- ▶ **Almost three-quarters of the schools host a sustainability competition on campus.**
Seventy percent of the schools have sustainability competitions on at least an annual basis to promote one or more of the following: increased recycling, waste reduction, and energy or water conservation.



WHAT MIGHT 10% LOOK LIKE?

- + NEW CUSTODIAN
- + SECURITY STAFF

9. Focus on Behavioral Changes

Don't underestimate the power of a simple behavioral audit. Until wasteful behaviors are identified, they can't be changed. Institutions might consider online utilities where students can see energy consumption of one classroom or one dorm versus another in real time. Fostering competition and making responsible consumption fun are two keys to changing behavior.

10. Implement the Quick Fixes!

There are many actions that can be taken to yield nearly immediate returns for the plan. These include:

- *Energy policy measures like removing refrigerators from offices and individual dorms.*
- *Installation of energy management tools for computers and appliances.*
- *Eliminating phantom loads and removing unused meters.*
- *Replacing lighting with more energy-efficient bulbs— lighting is 30 percent of a university's energy budget.⁵*
- *Eliminating the number of bulbs lit as well as the wattage of each bulb. Test actual lumens in the classrooms before changing the lighting.*
- *In humid climates, consolidating mold-sensitive equipment in one area or wing and controlling the climate in this area discretely.*
- *Regulating temperatures without risk of human tampering (e.g., install thermostats in the ceiling).*
- *Keeping doors and windows closed; installing sensors.*
- *Reviewing maintenance procedures and making efficiency part of maintenance policy.*
- *Removing interior lights on vending machines; scheduling power on/power off cycles.*
- *Installing outdoor lighting sensors.*
- *Replacing exit signs with LEDs.*

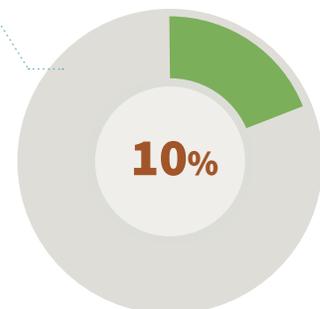
The University of Illinois at Urbana-Champaign not only met its **goal of reducing energy consumption by 10% by picking the low hanging fruit**, but also saved \$5 million as a result. This goal, scheduled to be met in a year, was achieved in ten months.

11. Plan for the Long Term

Institutions should consider performance contracts and design/builds after they have addressed what can be done in-house. Building a comprehensive maintenance program into the plan can save thousands of dollars that otherwise might go to outside contractors. Effective energy plans will include ongoing preventive maintenance and long-range capital planning.

Secondary phases of the energy plan may incorporate long-term investment in new systems or transitional measures for mechanical upgrades or new builds. Be certain to include these planned purchases in capital budget projections, as well as the ongoing maintenance costs of existing and new equipment.

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN



**REDUCED
ENERGY CONSUMPTION
WITH QUICK FIXES &
SAVED \$5 MILLION
(IN 10 MONTHS)**

12. Celebrate Your Success, Then Reevaluate Everything

When a college or university successfully achieves energy goals, it must look for ways to celebrate the success: broadcast the results proudly. Then take the time to evaluate what has been done. What worked? What didn't work? At this point, the institution should reassess energy metrics, phases, and future goals. The successful process never ends, but is continuous.



How to Get it Done

Throughout the energy management process, one thing will become increasingly clear: the importance of data. Without the establishment of an accurate baseline, and the ongoing precise tracking of metrics, any energy plan is doomed to make assumptions that will limit its potential.

SchoolDude has a tool to ensure that utility data is tracked with precision, maximizing the potential of energy management plans. UtilityDirect is a powerful, online utility tracking, management, analysis and reporting tool that audits, tracks and analyzes utility consumption and costs to identify utility savings opportunities.

UtilityDirect helps reduce utility bills by identifying utility waste, cost and meter problems, billing errors and savings opportunities, which can save at least 5% of the annual utility budget, an average of \$10 per student annually.

SchoolDude represents the largest single database of education energy information in America! Because effectively managing energy costs starts with utility bill analysis, UtilityDirect provides a solid foundation for any energy management and conservation program.

ABOUT SCHOOLDUDE

Founded in 1999, SchoolDude has served as the market leader in education enterprise asset management for the past 13 years with over 1 million education professionals using our solutions. We deliver cloud-based solutions to help both small and large institutions better manage their facilities, IT and business operations. We help clients save time and money by managing support services effectively and efficiently, allowing institutions to provide a safe teaching and learning environment. Today, we're the #1 platform of cloud solutions for public and private schools, colleges and universities. Visit us at schooldude.com or give us a call at 877-868-3833 to learn more.

For more information on SchoolDude's UtilityDirect, or for more information on how to make utility bill analysis the foundation of a successful energy management program at your college or university, contact: salesrequest@schooldude.com.

NOTES

1. "Energy Management as a Corporate Strategy," Steven Hanawalt, OSIsoft, 2009 Uptime Institute Symposium: Lean, Clean, and Green.
2. "Higher Education: An Overview of Energy Use and Energy Efficiency Opportunities," The U.S. Environmental Protection Agency, http://www.energystar.gov/ia/business/challenge/learn_more/HigherEducation.pdf
3. "The Rise of the Energy Manager Role," Tom Raftery, GreenMonk: the blog, February 9, 2010
4. "Elevate Energy Management to Senior Managers," The U.S. Environmental Protection Agency, http://www.energystar.gov/index.cfm?c=industry.bus_industry_elevating
5. "Managing Energy Costs in Colleges and Universities," National Grid, http://www.nationalgridus.com/non_html/shared_energycost_college.pdf