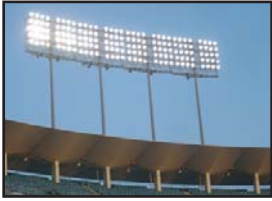


Campus Hot Spots For Energy Savings



Event Allocation

Sporting events, concerts and festivals all require large amounts of energy. Campuses use submeters to monitor usage of parking and stadium lighting, sound systems and vendors for accurate allocation of energy costs back to the event sponsors. Campuses generate accurate energy usage statements for individual events avoiding costly estimation errors and ensuring that all event energy costs are recovered.



Leased Spaces

Restaurants, coffee shops and retail stores all play an important role in campus life. These leased spaces use energy at different rates. Campuses are now able to install submeters to monitor each individual leased space and generate energy statements based on their individual energy use. This increases tenant satisfaction because they know they are only accountable for the energy they use, while the campus benefits from recovering all tenant energy costs. Campuses also install submeters on common areas, allowing them to more effectively manage common area costs.



Department Allocation

Chemistry, Accounting, Mathematics and Engineering are just a few of the departments that have classrooms and administration offices with budget accountability. Metering each department allows users to take advantage of energy-saving opportunities which may be as simple as turning off lights or computers when rooms are not in use. When department budgets include energy use, users will be inclined to take the necessary steps to ease the pressure on their budgets by reducing overall energy use.



Student Housing & Dormitory Monitoring

Students use energy. Those held accountable for what they use will use less. This is the premise for metering energy consumption in student housing and dormitories. Campuses install submeters on individual spaces and generate usage statements for each student. Because they are responsible for the energy they actually use, students will be more inclined to take energy-saving measures such as closing windows to keep heat or air conditioning from running or turning off lights and other electronic items when no one is there.



Equipment Maintenance Programs

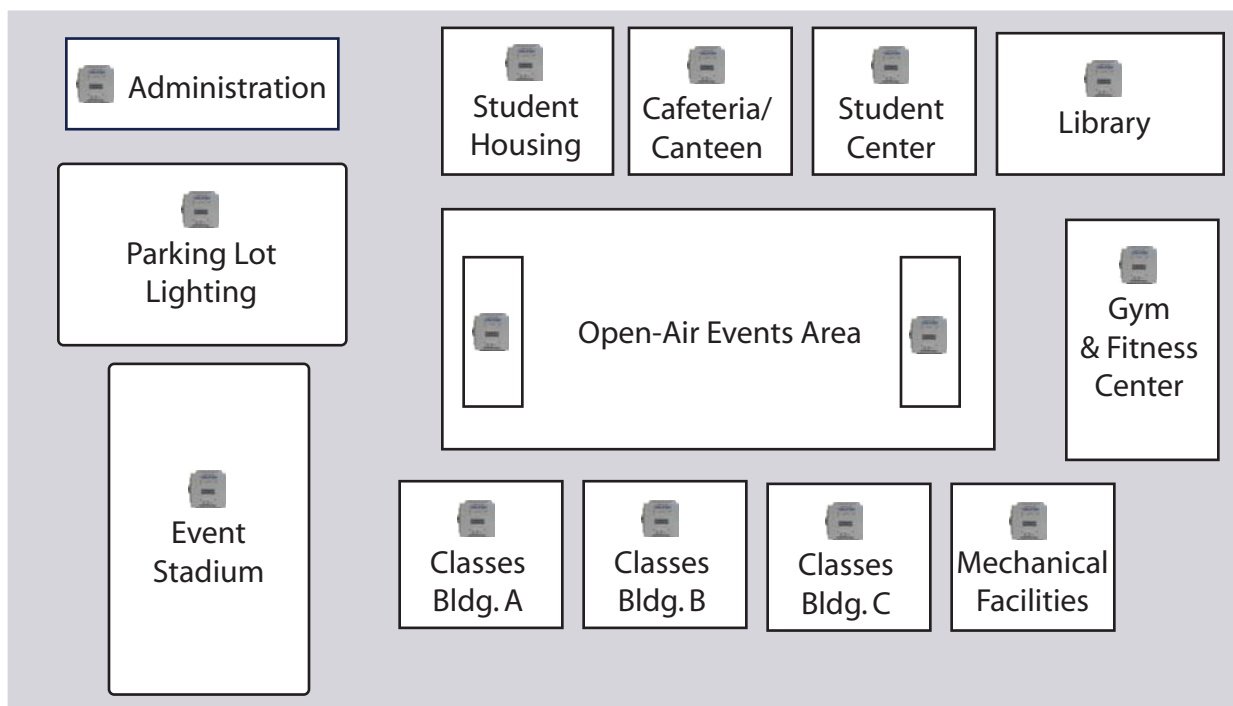
As the cost of education increases and budgets are more constrained, it is more important than ever to avoid costly equipment replacement. Submeters can be installed on key pieces of equipment to identify potential equipment failures. This allows facility managers to take steps to schedule repairs before equipment fails, thus avoiding costly and unexpected downtimes.

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Campus Metering Application

Typical Campus Facility Metered Point Map



Applications

1. Allocate energy usage to specific departments and/or buildings.
2. Monitor HVAC equipment to identify inefficiencies.
3. Monitor building equipment to identify potential failures before they happen.
4. Allocate usage to individual tenants.
5. Accurately monitor common areas.
6. Allocate costs of energy used during events.

Additional Metered Items

1. Total common areas.
2. HVAC equipment by building or overall campus.
3. Lighting for parking lots, walkways, event stages and stadiums.
4. Specific departments within class buildings.
5. Common area lighting within buildings.
6. Individual meters for leased spaces.
7. Specific departments within administration.

Alternative System Configurations

1. Automatic meter reading. Install IDRs to gather meter data so meters can be remotely read via computer.
2. Utilize E-Mon Energy™ software to generate individualized tenant usage statements, demand profiles and energy graphs.
3. MMU Cabinets. Order meters installed in one compact enclosure and save installation time and valuable building space.

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Energy Intelligence for Higher Education

Submetering Technology Can Help Facilities Cut Costs Without Compromising Education Quality



Amidst the rising costs of education and current budget crisis at many universities, educators and administrators are searching for innovative ways to cut costs without compromising education quality. One often-overlooked cost-cutting opportunity is energy consumption. Power is among the most basic needs of any education facility. This fact often leads both administrators and facility managers to view energy as a fixed cost. But in reality, energy and its associated costs can be managed. And when energy is managed efficiently, facilities can allocate costs, drive energy conservation, reduce operational expense and ultimately improve their bottom line.

To effectively manage energy, it is necessary to understand how it is used and consumed throughout the campus or a particular facility. Submetering technology, combined with a complete energy intelligence system, is essential to gaining this understanding.

In short, submetering involves the installation of separate meters, behind the primary billing meter, for each building or system to be monitored. The separate meters are then used to monitor and allocate energy use of these specific buildings, departments or systems. Combining submeters with a solid energy intelligence system allows users to better understand when, where and how energy is being used within their organizations, as well as the power quality levels at each monitored point.

Through dial-up or cable modems (or via a university LAN—many of which have been upgraded via significant investments in recent years), all information gathered by the submeters can be transferred to an identified administrative server or

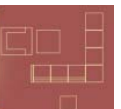
computer where the information is automatically sorted into the appropriate database. The information can then be used to determine specific inefficient energy processes, allocate utility costs accurately, generate customizable billing for each monitored system, and ultimately guide the development of energy conservation initiatives and verify their results. Universities may also use the added energy intelligence to shift energy loads, lowering demand charges, as well as to shave energy demand during peak hours when prices can be highest.

Schools and universities face many unique energy-related challenges. A majority of schools must deal with aging buildings that use energy inefficiently and are expensive to maintain. Ongoing and sensitive research projects require 24-hour, high-quality power. Student housing and recreation facilities—again, often old and inefficient—require ‘round-the-clock’ cooling, heating and power for other activities. Furthermore, without cost accountability, many students and on-campus vendors waste energy. According to Platts Consulting and Research, educational facilities in the United States and Canada pay nearly \$9 billion a year for energy.

By installing submetering technology and employing a comprehensive energy intelligence system, schools and universities can gain important snapshots of their energy use. With this information, facility managers can better control costs and improve operational efficiencies. For example, by measuring actual departmental or building energy use, facility managers can identify chronic energy-wasting equipment and bad usage habits. They can then use this information to manage maintenance and capital improvement activities—directing resources to the areas that can offer the biggest return on investment.

Submetering also enables educational facilities to allocate energy costs to the actual users of the energy. Thus, facility managers can apportion energy charges to departments, student housing, tenants in the student center and individual buildings. Allocating energy costs this way rather than on a square footage basis is also more equitable. For example, a high-tech lab is likely to use far more energy than the neighboring English department. Furthermore, at many universities, decades of departmental disputes over this very issue have been resolved through submetering. In addition, it can encourage conservation and cost allocation by the users of the energy. In fact, industry studies have shown that submetering and cost allocation alone can reduce energy consumption anywhere from 5 percent to 18 percent.

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Another common benefit of submetering at educational facilities includes power-quality measurement. Power quality is an extremely important issue for sensitive high-tech equipment, as well as items such as food service refrigerators, both of which can be easily knocked offline by power fluctuations. In the case of lab and computer equipment, poor power quality can result in corruption of data, can negatively impact sensitive research and may result in costly IT repairs. The damage is no less costly for food service equipment, where an offline refrigerator can result in costly losses of food.

In deregulated markets, submetering technology is essential for helping a sizable facility understand its energy use and negotiate the most competitive rate possible. In this way, a campus can significantly lower its energy costs. Submetering also can help facility managers address other power issues that can be intensified in deregulated markets, such as managing energy tariffs during peak usage times.

Selecting the Right Energy Course

In order to fully maximize the benefits provided by a submetering system, it is vital that a university select a comprehensive, flexible and industry-proven submetering system. Facility managers should seek submetering technology from an experienced and dedicated system provider that integrates a complete energy intelligence system and has a proven track record of reducing costs.

The first step in installing a submetering system is to define the project scope. University administrators and facility managers should identify the key goals and objectives they want accomplished by an energy intelligence system. A submeter vendor should visit the campus facility to “walk” the site, evaluating the current total energy usage for the entire campus. Together, the campus facility manager and the submetering provider will closely examine areas/buildings on campus that are suspected to have high energy consumption, older buildings that may demonstrate energy efficiencies, and current methods used by the university to allocate energy costs between departments, residents, tenants and individual buildings. Through a comprehensive evaluation of the university’s current energy usage, the energy intelligence provider will be able to determine the most appropriate submetering system to address the needs and meet the goals and objectives of the university.

Once the energy intelligence needs of the facility have been assessed, the vendor will work with campus facility management to design and select a customized submetering system. An experienced energy intelligence provider knows that each campus facility is unique; therefore, a submetering technology system must be tailored to meet the specialized needs of any individual school or university. An energy intelligence system that is well-designed will allow the flexibility to meet changing energy consumption needs in the future.

Submetering at Work

At Bowling Green State University in Bowling Green, Ohio, the Residence Life Department first installed submeters in auxiliary areas (i.e., dining and residence halls) about seven years ago. Prior to that, according to Robert Hayward, Director of Administrative Services for Facility Services, the school was billing and allocating the utility costs for these areas via an antiquated square footage-based system.

Today, Bowling Green is in the process of upgrading its system by installing new submeters in 20 buildings (and replacing the older models) to monitor and measure electricity with software to manage the submetering system.

“As income areas, the resident life department units have a bottom line to meet. Due to budget constraints, they discerned that they might be over-charged for power usage and wanted accurate allocation and billing for electricity,” said Hayward. “Submetering has worked well, and we have plans to measure natural gas and water in the near future. Additionally, the University’s old system used modems, but three to four years ago, Bowling Green installed an Internet backbone, and we’re now hooking up to that.”

This is just one instance where a school is using submetering technology to monitor power usage, improve cost allocation and billing accuracy, and generate cost savings. From reducing energy costs to enhancing conservation efforts, a well-designed and effective submetering system can help schools and universities collect an array of vital power monitoring intelligence.

Summary

With many educational institutions today facing record budget deficits, finding innovative methods to control bottom-line costs is key to maintaining current programs and keeping the cost of education affordable. Controlling energy costs can help mitigate other rising costs that may be more difficult to control.

With such weighty issues facing higher education, energy management provides a relatively easy-to-implement, cost-effective means to save money and conserve energy.

