

ENERGY SUBMETERING: BENEFITS & APPLICATIONS



Energy Management is a growing practice among large companies. Successful energy management requires detailed information on how the energy is being used; however, this information is not available in facilities which aren't submetered. For proper energy management, it is necessary for facility managers to understand how and where energy is being consumed.

Energy efficiency is the first step in achieving sustainability in buildings and helps to control increasing energy costs while reducing environmental footprints. An energy management system (EMS) can provide metering, submetering, and monitoring functions that allow facility managers to gather data that allows them to make more informed decisions about energy use.

1. What is Submetering?

Submetering is the installation of metering devices with the ability to measure energy usage after the primary utility meter. Submetering offers the ability to monitor energy usage for individual tenants, departments, pieces of equipment or other loads individually to account for their actual energy usage. With submetering, a clear and accurate picture of how and when energy is being consumed inside a facility is created.

Submeters are physical metering devices that monitor electricity, gas, water, and other utilities. Utilities sell services and use utility grade meters to gather this information; submeters mirror this data collection for companies that install them. Submetering provides facility managers with the measurement capability to better control energy usage in a building.

2. What are the Benefits of Submetering?

Increasing energy costs are frequently the largest variable expense for commercial and industrial facilities; the installation of submeters can provide numerous benefits to the facility manager. Real-time submetering data can help facility managers drive savings by highlighting opportunities to optimize equipment and site performance. This data can provide feedback on energy consumption; how much energy is being used throughout the day and identify which areas are consuming more energy than necessary.

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Benefits of Submetering:

- Accurate energy monitoring, real-time energy consumption
- Granular in-depth review of facility energy data
- Better informed to make decisions that can help optimize energy performance
- Ability to record actual energy usage (no estimates)
- Comparison of usage across similar facilities over time
- Ability to identify and eliminate wasted energy
- Early access to maintenance issues for repair before critical equipment fails

It is critical that efficient control of energy usage be executed in a manner that reduces energy consumption while properly maintaining a building's environment and functionality.

3. Submetering Applications

Peak Demand Management

One of the easiest way to lose control of electricity costs is by what utilities refer to as "Peak Demand" charges. In this situation, a utility will charge a greater cost per kWh when demand is greater in order to prevent all consumers from maximum consumption during these peak times. The utility company argues that the grid must be able to support each customer's max consumption, therefore the grid must be built in order to support each customer would get charged based on their max kW rate. The strategy is that by increasing the cost per kWh, consumers will shift their usage to off-peak and reduce the chance that the grid reaches dangerous capacity levels.

Submeters allow the end user to receive detailed consumption information, which allows the customer to avoid cost increases with time-of-usage billing and to take advantage of off-peak rates. To reduce facility costs, some facilities managers of energy intensive processes have been known to change their production to a night shift when energy rates are lower. Peak demand management is not limited to use in industrial facilities, this strategy can save generate significant savings in commercial and residential facilities when used effectively.

Tenant Submetering

In non-submetered commercial and residential buildings, tenants are typically billed on square footage of rented space. In this scenario, the landlord receives an electrical bill for the entire facility and bills each tenant based on the amount of space they rent. The problem here is that tenants are not billed based on consumption behavior, but rather they are billed based on the total consumption of the rest of the tenants. Because tenants realize that they are not billed based on individual consumption, there is no incentive to reduce consumption because the expectation is that if nobody else changes their behavior then each tenant will still pay the same amount; it's a prisoners dilemma.

Tenant submetering allows each tenant to be billed only for the energy consumed within the rented space. Tenant submetering changes behavior because everyone becomes accountable for their own consumption behavior. Studies have shown that monitoring energy consumption by the end users monitor their energy consumption they may reduce up to 15% of their energy.

Energy Cost Allocation

With rising energy costs and a greater emphasis on energy efficiency, all types of facilities are looking to better understand their consumption and what is driving increased electrical

bills. In commercial applications, HVAC/R equipment, computers, servers, printers, copiers, projectors all consume a significant amount of energy. In industrial facilities process equipment typically is a heavy consumer of electricity. Submetering gives the user the ability to monitor individual equipment, so that energy costs can be allocated to different departments and processes. Using this data, energy costs can be allocated to each department or process, giving management a better understanding of the true costs associated.

Equipment Monitoring

The use of submeters in conjunction with energy management software gives end users the ability to monitor the status of equipment to ensure that they are functioning properly. Regardless of the type of equipment, the meter can gather and report valuable data to better understand status of individual equipment. The end user can use the data to view trends over time in order to understand with confidence that a machine is working properly.

Abnormal Behavior Alerts and Notifications

Most energy management software comes with the ability to do remote alarming. The programs are customizable for the end user to set alarms for any monitored parameter which reaches abnormal levels. Alarms are typically sent via text message or email in order to provide the end user with an immediate notification that something is not normal. Setting remote alarms is particularly useful once an energy consumption baseline is determined within a facility at different times of the day. In this case, an alert can be sent if consumption rates are above average when everything is supposed to be shut down; which will allow the end user to visit the facility and quickly figure out which process was left running.

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About Setra:

Founded by former professors of Engineering at Massachusetts Institute of Technology (M.I.T.), Setra has been designing and manufacturing sensor products since 1967. Our specialty is in the pressure and sensing in a wide range of markets including HVAC/R building automation, pharmaceutical, energy, medical sterilization, industrial OEM, test & measurement, meteorology and semiconductor.

Setra Creates Solutions:

- Over 40 years of expertise in sensing and sensing applications
- R&D and Design Engineerings focused providing application solutions
- Sensors cover a wide range of pressure ranges with unique expertise in low pressures
- Sales and manufacturing in the U.S., Europe, and Asia for fast solutions and products

