Wisconsin Sustainable Business Council

Best Management Practices

ESI - Environmental Systems, Inc. – Continual Reassessment and Adjustment

Challenge

Environmental Systems, Inc. (ESI) provides services and technology in the areas of building control and automation through advanced software applications, energy management, building systems integration and security. These services improve occupant comfort and reduce energy consumption and operating costs. The company's LEED Platinum-certified headquarters is located in Brookfield, Wisconsin.

A key part of ESI's model is not only to set up an efficient system, but also to continually assess the effectiveness of the system and then make adjustments for further improvements. The LEED Platinum certification was a great achievement, but the company wanted to go further, since LEED certification doesn't reflect actual performance over time. ESI wanted to make sure they were achieving superior energy efficiency over the long run, and committed to improve their performance.

Strategy

ESI looked at all processes taking place in the building and quantitatively measured everything that is measurable. They also sought input from their employees (it doesn't hurt that the majority of the employees happen to be engineers). When they noticed an area that could be improved, they made the necessary adjustments and put in place a system of monitoring where relevant.

Some of the improvements were simple, one-time fixes, such as replacing CFL light bulbs with LEDs. When ESI discovered that the fixtures in their front hallway/foyer would not accommodate LED bulbs, they decided to change out the fixtures, and still ended up saving money!

Other improvements were more complex and required putting in place a system of continued oversight. For example, by analyzing the electrical load profile, ESI discovered that the electric humidifier was the single largest contributor to their electrical load and was responsible for setting their peak demand level. An investigation into alternatives was done, along with an ROI analysis; including both first and life cycle costs and savings. As a result, the electric humidifier is being replaced by a gas-fired humidifier with a simple payback of less than three years.

Screenshot of ESI's Building Performance Manager

Tom Eggert, *Executive Director*
975 University Ave, Madison, WI 53706
608.267.2761
sustain@bus.wisc.edu

Green Masters Program

They also made improvements such as adjusting occupancy sensor sensitivity and calibrating CO2 sensors every six months. They continue to monitor all system data through a continuous commissioning process driven by an analytics engine and integrated with a work order management system.

Results

In 2010, the first year of operation, the building achieved savings of $31,914 compared to a building built to ASHRAE 90.1-2004, the code standard at the time of construction. Through ten months of 2011, the building has achieved additional savings of $9,600. Significant additional savings from the gas-fired humidifier are expected when it is on-line in mid-November. All parameters, including energy consumption, are measured in real-time and managed through the continuous commissioning process.

The improvements up to this point have led to strong results, but ESI knows that the job is never finished. One of the achievements that management is most proud of is its score in the Energy Star Energy Utilization Index, because the index reflects actual energy efficiency performance over time. ESI's headquarters obtained 98/100 in 2011, making it one of the most energy efficient buildings in Wisconsin. The index is updated each year, preventing ESI from being able to rest on their laurels.

Buildings are dynamic and must be managed accordingly. It is not enough to set up an efficient, well thought-out system and then ignore it. Through continuous measurement and analysis, processes need to be updated, recalibrated and reassessed in order to ensure on-going savings and efficient performance and realize a maximum return on the investment.

Paul Oswald, President ESI: Paul.Oswald@thinkesi.com
Mike O'Connor, Service Team Lead: Mike.Oconnor@thinkesi.com