Building Analytics Success Story

Stanford University Residential & Dining Enterprises

Just a few years ago, Stanford University's Residential and Dining Enterprises could not track utility consumption in a meaningful way. With 2,000 utility accounts across three different utility providers and no software to monitor consumption, it was a challenge to manage. Stanford was 'just paying the bills,' a scenario that is all too common. This changed when they added hundreds of meters and an energy information system (EIS) to track utilities and locate savings opportunities.

What is an EIS?

An EIS is a combination of software, data acquisition, and communication systems used to store, analyze, and display building energy meter data on an hourly or more frequent basis. EIS is one type of energy management and information system (EMIS).

We have over 50 individuals responsible for building management that had never seen any consumption information. With EIS, now we can all be utility managers.

Kristin Parineh
Sustainability & Utilities Manager

To get their EIS up and running, Stanford connected all energy, water, and waste data - 963 meters, including 375 electric interval meters. Through this process, they focused on data quality so the meter data could be trusted. Stanford uses their EIS in the following ways:

- Review daily, monthly and annual energy, waste and water use trends and targets for groups of similar buildings such as dining halls, undergraduate dorms and apartment style residences.
- Track the performance of efficiency projects and behavioral change programs with students.
- Use 'heat map' charts to identify periods of unnecessary operation sing the heat map function

By creating a systematic way to review key performance indicators and analytics in the EIS, the university has saved $450,000 across their portfolio.

Quick Facts

Location: Stanford, CA

Building type: University residences and dining

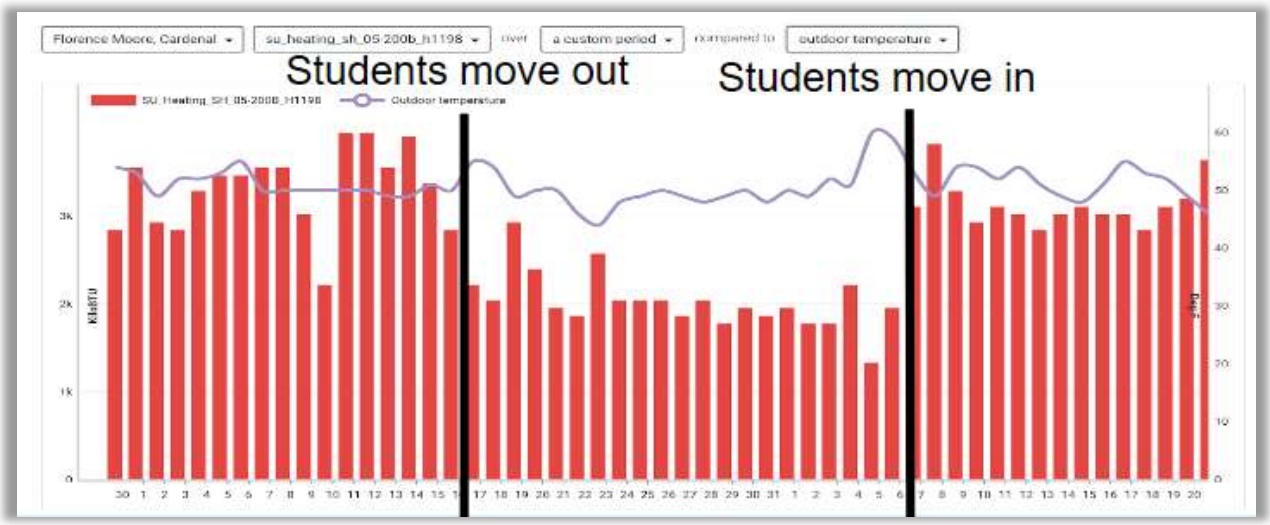
Floor area with EMIS: 4.9 million sq ft, 315 facilities

Energy savings: 4% chilled water, 5% electric, 9% hot water, 10% gas for $451k in cost savings in the first year.

EIS Software: Lucid BuildingOS

Smart Energy Analytics Campaign: Recognition for New Installation of EIS in a Portfolio

Stanford Residence and Dining Enterprises was recognized by Lawrence Berkeley National Laboratory and the U.S. Dept. of Energy during the Building Commissioning Association conference in October 2018 for their exemplary work to save energy using an EIS.



Stanford's energy tracking in the residence halls over winter break shows a reduction (Graphic: Lucid BuildingOS)

Driving Action with Data

In addition to energy, water, and waste data, Stanford collects data on the number of meals served in their dining halls, and they decided to bring this data stream into their EIS. Stanford was able to benchmark dining halls against one another and focus their efforts towards lowering consumption at the most energy-intensive locations. Now they track energy cost per meal served on an ongoing basis.

Stanford is also working with students to reduce energy use when the residence halls are unoccupied. During last year's winter break, they asked students to turn off their thermostat, lights, and appliances, and followed up with residences that didn't show reduced energy usage. These efforts resulted in a 17% reduction in energy use over three weeks relative to the previous year – a savings of $34,000.

EIS and Asset Management

Nearing completion with the integration of their work order and asset data with their EIS, Stanford will have a view into the relationship between the condition of thousands of energy-consuming assets and their buildings' overall energy consumption. Through a combination of analytic tools and a sound process for using those tools, Stanford is well on their way to transforming their energy management practices.

Integration of meals served data with energy data to create an 'energy cost per meal' metric

The Smart Energy Analytics Campaign is a public-private sector partnership program focused on commercially available Energy Management and Information Systems (EMIS) and monitoring-based commissioning practices. The campaign couples technical assistance with qualitative and quantitative data collection to inform research, development, and field study priorities. Partnering participants are encouraged to share their progress and may receive national recognition for implementations that demonstrate exemplary practices.