Building Analytics Success Story
CSU Dominguez Hills

California State University, Dominquez Hills (CSUDH) has fault detection and diagnostic (FDD) software on 22 buildings across campus, tracking data from 183 energy meters and over 9,000 points from their building automation system (BAS). This robust installation didn't happen overnight but was pulled together incrementally over the course of 4 years without a large impact on the facilities budget in any one year.

FDD helps the facilities team find savings opportunities and make sure performance doesn't drift after the implementation of energy efficiency measures. CSUDH's energy manager relies on FDD email alerts and monthly reports created by their service provider. For the 22 buildings with FDD the monthly report lists problems (prioritized by importance) which are then turned into work orders for the facilities team or outside contractors. CSUDH also uses the FDD software to give data to outside engineers for campus master planning to determine current needs for new buildings.

What is FDD?

Fault Detection and Diagnostic (FDD) software identifies buildings with suboptimal performance by analyzing building automation system (BAS) data. FDD is one type of energy management and information system (EMIS).

EMIS Supports Innovation

The data transparency and flexibility provided by CSUDH's FDD system has helped open the door to more holistic opportunities for advanced projects and partnerships. CSUDH uses their FDD software to help validate energy savings from new technologies and control sequences. For example, CSUDH recently installed smart energy valves and used their analytic software to analyze savings.

I shared the data with everyone I could to build excitement around it and show how easy it was to do. The business case built itself by sharing the data and giving log-in access to the anyone that wanted to see more.

- Kenny Seeton, Energy Manager

Quick Facts

Location: Carson, California

Building type: University Campus

Floor area: 1.2 million sq ft

Total buildings with EMIS: 22

Service provider: EcoVox, Inc.

FDD Software: SkySpark by SkyFoundry

Smart Energy Analytics Campaign: Recognition for Innovation

California State University Dominguez Hills was recognized by Lawrence Berkeley National Laboratory and the U.S. Dept. of Energy in May 2018 for Innovation in the Use of Energy Management and Information Systems (EMIS).

FDD helps CSUDH ensure systems operate as intended during and after demand response events

FDD has also proven useful in supporting demand response efforts – the FDD software monitors system performance during and after a demand response event to ensure that systems turn down as intended and subsequently return to normal operation. CSUDH's energy manager doesn't believe these and other innovative projects would have been considered if it were not for the easy access to data allowed through the EMIS.

Top Opportunities

The most common measures implemented with the support of CSUDH's FDD software have included:

- Improved HVAC scheduling and setpoints
- Improved economizer control
- Optimized equipment staging
- Control loop tuning
- Reduced VAV box min airflow
- Supply air temperature and duct static pressure resets

The FDD system automatically analyzes their BAS and meter data to look for measures like these and more, focusing facility staff time on optimizing systems and proactive maintenance rather than random inspections and responding to system breakdowns.

Funding the EMIS

Upfront cost is often a major hurdle for organizations getting started with analytics. CSUDH tackled this through implementing their system over the course of multiple projects in phases. For instance, they installed energy meters over many years using in-house labor to save cost. The CSUDH energy manager's mantra is "slow and steady", as he continues to build out his EMIS. He advises to have analytics proposals prepared, to be ready when funding streams become available.

Having FDD gives me the confidence to take on innovative projects, knowing that we'll be able to easily see the performance and cost benefits.

- Kenny Seeton, Energy Manager

CSUDH has performed monitoring-based commissioning (MBCx) twice – the first time resulted in $100,000 energy cost savings, then 6 months later they went deeper and uncovered opportunities for another $100,000 in savings. Now they strive to maintain savings using FDD to identify performance degradation.

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.