

**FACILITIES
MANAGEMENT
CONFERENCE
2014**

**BPA Winning
Campus:**

California State University,
Sacramento

Project Name:

SMART GRID

Budget:

\$8,545,000

Delivery Method:

Design, Bid, Build

Key Contributors:

CSU Sacramento

Linda Hafar
Paul Serafimidis
Nat Martin

Sacramento Municipal Utility
District

SAIC Energy, Environment
and Infrastructure LLC

Schedule:

11/18/2011 - 6/20/2013

**BEST PRACTICE AWARD CATEGORY:
ENERGY RETROFIT**

Key Challenges

1. Budget – High project cost.
2. Interfacing with legacy systems.
3. DOE grant process (requirements, documentation & reporting).

**What makes this project a
Best Practice Award Winner?**

1. **Innovative:** First campus to implement a SMART GRID project with this level of interoperability.
2. **Cost Savings:** Cost Savings: \$444K annually + \$200K in incentives
3. **Process Improvement:** Energy Management Control systems are essential to diagnosing and correcting problems when rooms in a building exceed comfort thresholds. The four existing systems on campus were incompatible and did not ‘talk’ to each other. This failure to communicate made it very difficult to maintain or improve occupant comfort in 44 buildings across campus. The SMART GRID Project replaced the existing four control systems with a new Tridium control system.
4. **Replicated on Other Campuses:** **Y/N; Why?** Yes, most campuses have these types of systems

and the ability to link directly to their utility provider. Additionally most campuses have interest in participating in Auto Demand Response programs which these systems help to achieve.

5. **Contribution to Success of the Campus: Y/N; Why?** Yes, this project helped to address some major heating/cooling maintenance issues and will help campus identify potential problems before they occur. It will allow the campus to leverage utility savings for other projects to further reduce energy use and greenhouse gas emissions.
6. **Other Criteria?** Leveraged alternative funding through Department of Energy grant program.

Project Description

The California State University, Sacramento has leveraged the latest in SMART GRID technology, “An integrated communications and power system infrastructure which allows for robust two-way communications, advanced sensors, and distributed computers to improve the efficiency, reliability and safety of power delivery and use,” to integrate four major aspects of its energy operations: The Energy Management Control System, Electronic Meter and Reporting Software, Electric Vehicle

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Charging Stations and Electric Grid Reliability. Campus has capitalized on the ability for two-way communication via the internet between SMUD's new Demand Response Management System (DRMS) and Sac State's new Energy Management Control System (EMCS).

This project was funded through a grant from DOE which was implemented by Sacramento Municipal Utility District (SMUD). Sac State partnered with SMUD in the application and was awarded \$4,272,500. The university was required to match the awarded amount.

The project has achieved significant energy savings and greenhouse gas reductions and will continue to expand these savings with the ongoing use of the system. In the future, this SMART GRID system will allow Sac State to not only respond to an Auto Demand Response request from SMUD because of electrical system emergencies, but will allow Sac State the ability to also respond to Time of Use (TOU) electrical price signals. This feature will provide the flexibility to respond in real time to future TOU price signals thus reducing future utility cost. This is an issue that every campus will need to address in the future.

The SMART GRID project energy savings are as follows:

Electrical Savings:

- 3,130,262 kWh/year
- \$ 276K/year
- 969 Metric Tons of CO2 reduction/year

Natural Gas Savings:

- 214,562 Therm/year
- \$168K/year
- 1,136 Metric Tons of CO2 reduction/year

The anticipated annual energy cost savings is approximately = \$444K

Incentives

The project has made successful use of the UC/CSU/IOU Energy Efficiency Partnership incentive program to assist in project cost recovery receiving \$124,546 to date, and an estimated \$75,000 still pending later this year.

Put simply, this project is the future of energy management technology. The campus has demonstrated the ability to work with its utility district and leverage federal grant dollars to move forward with technology that will set them apart in the world of grid management, demand response and operational best practices. This innovative project has yielded and will continue to yield tremendous energy savings; it has demonstrated a collaborative approach to micro-grid technology, and it has proven that this technology is well within the reach of campuses throughout the CSU system.