



“Achieving such a significant level of energy savings was a huge collective effort involving everyone working together to lower operating costs and protect the environment.”

ANNA LEVITT
ASSISTANT ENERGY
MANAGER, UC SAN DIEGO

Annual Savings: 8,313,000 kWh; 325,300 therms
SDG&E[®] Incentives: \$2,397,000

Highlights

- Monitoring-based commissioning (MBCx)
- Constant volume (CV) to variable air volume (VAV)
- VAV occupancy sensors and digital controls
- Campus-wide interior lighting change out
- Data center load shedding
- 30 MW natural gas co-generation plant featuring SCONOX technology to reduce emissions
- 2.8 MW molten-carbonate fuel cell
- 1.2 MW photovoltaic (PV) solar and concentrated PV demonstration system

Striving for excellence in energy efficiency

UC San Diego has the size and complexity of a small city with a campus that contains 11 million square feet of building space and an average daily population of more than 45,000. As a research and medical institution, many of the university's spaces have two times the energy density of a commercial office building. The driving forces behind UC San Diego's comprehensive energy-efficient efforts are lowering overall operating costs and reducing greenhouse gas emissions, in order to comply with Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006.

A key and essential element to the university's energy saving success is active participation in SDG&E's UC/CSU/IOU Partnership Incentive Program. Anna Levitt, Assistant Energy

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UC San Diego's fuel cell is currently the biggest commercially available fuel cell on the market and helps the university generate 85% of its own energy.





About UC San Diego

UC San Diego is a public research university occupying more than 2,100 acres in La Jolla. The university is dedicated to the advancement of knowledge through excellence in education and research at the undergraduate, graduate, professional school and postdoctoral levels. UC San Diego is recognized as one of the top ten public universities by *U.S. News & World Report*. The university is the fourth largest employer in San Diego County.

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Manager at UC San Diego explains, "It's the incentive levels that allow our whole energy-efficiency program to be financially possible."

Optimizing performance across campus

Through monitoring-based commissioning (MBCx), UC San Diego is able to remotely monitor systems campus wide, ensure they are operating at maximum efficiency levels, and address unusual spikes in energy use. The university also migrated from constant volume (CV) to variable air volume (VAV), which manages airflow based on actual demand. This VAV upgrade included occupancy sensors and digital controls, which allow UC San Diego to save energy by lowering air exchange rates while maintaining safe levels of ventilation. The occupancy sensors automatically increase and decrease airflow on demand, while the new digital controls allow for remote management of temperature set points. "The new controls contribute to ongoing energy savings on nights and weekends, plus they make it easier to respond during a demand response event," states John Dilliot, Manager of Energy and Utilities at UC San Diego. The university's participation in demand response events is through SDG&E's Capacity Bidding Program (CBP). UC San Diego uses data center load shedding to significantly drop energy levels during an event. This demand response practice involves the university stopping work at its super computer center, which has CPUs constantly running computational algorithms.

Another one of UC San Diego's energy saving measures included a campus-wide interior lighting upgrade which involved replacing approximately 100,000 T12 fluorescent lamps to the lowest 25 watt T8 bulbs. Levitt notes, "We were individually retrofitting lights as they went out, which would have taken a long time to complete. Instead, the Partnership

Incentive Program was able to fund 50% of the effort so we could complete the change out all at once. We were also able to install occupancy sensors to control lighting and save a huge amount of energy."

A record amount of savings

In addition to the many energy-efficiency measures that the university recently implemented, UC San Diego's self-generating power initiatives are equally impressive. The university generates more than 85% of its own energy via a 30 MW natural gas co-generation power plant, 2.8 MW molten carbonate fuel cell and 1.2 MW solar photovoltaic (PV) on campus rooftops. UC San Diego's fuel cell generates energy using biogas, and is currently the biggest commercially available fuel cell on the market. "We are even working on adding energy storage to some of our systems to provide energy for both on- and off-peak periods," notes Dilliot.

Jim Tello, SDG&E Senior Account Executive points out, "UC San Diego's collective efforts have contributed to an annual energy savings of 8,313,000 kWh and 325,300 therms." And, as part of a three-year energy UC/CSU/IOU Partnership Incentive Program, UC San Diego expects to yield a total of \$7 million in energy savings, which includes \$2.397 million in SDG&E incentives. Levitt adds, "Achieving such a significant level of energy savings was a huge collective effort involving everyone working together to lower operating costs and protect the environment."

For more information

To learn which SDG&E program is right for your business, contact your SDG&E Account Executive, call the Energy Savings Center at: 1-800-644-6133 or email ESC@semprautilities.com.

These programs are funded by California utility customers and administered by SDG&E® under the auspices of the California Public Utilities Commission. Rebates and incentives are provided on a first-come, first-served basis until program funds are no longer available.

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