In-Depth Energy Resiliency Planning

AESC's Support for a Northern California Community College

Market Sector
Higher Education

Objective
In 2019 a community college in Northern California was impacted by numerous public safety power shutoff (PSPS) events, resulting in millions of dollars of lost revenue and unreimbursed expenses. Anticipating additional costly power outages, the college needed to understand their options for remaining powered during future events, to ensure uninterrupted services to students, faculty and staff.

Approach
The college engaged AESC's Building Energy Resiliency Planning Services to investigate their options, including utility-supported grid upgrades and a campus microgrid. AESC conducted an on-site energy efficiency (EE) audit with a generation and energy storage study. The resulting energy resiliency report provided the college the data they needed to plan a path forward.

The Challenge

PSPS events that are designed to mitigate wildfires risks create extended power outages and pose operational challenges.

For this college, located in a high-risk fire zone, PSPS events are becoming routine. With several options to pursue, the college needed to understand which one was the most cost-effective, and how to move forward with the final choice. Such an investigation required an unbiased, in-depth study by electrical and mechanical engineers with deep knowledge of the technical and financial considerations, who could liaise between the school and their utility and understand the constraints of each.

The Solution

The college engaged AESC to examine their campus's energy needs and strategize how to stay powered during future outages.

AESC performed a comprehensive energy resiliency study that informed the college of its options for maintaining power during an outage. Through an on-site EE audit plus a generation and storage study, along with multiple conversations with the local utility, the plan provided recommendations and detailed information that included:

- EE measures and load shedding strategies
- Available utility incentives and financing programs
- Assessment of available utility grid support
- Sizing and placement for an campus microgrid which can island, providing three days of self-sufficiency
- Rate analysis using current and projected future rates
- Financial modeling with estimated costs and timelines for each option
- Electrical single line diagram for front-of-the-meter storage and back-up generation
- Detailed generation, storage and microgrid controls equipment specifications
- Power flow modeling
- Microgrid operations description

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aesc-inc.com/programs

Are you wondering how to make your buildings energy resilient?

Contact us to discuss how we can help you get started.

info@aesc-inc.com

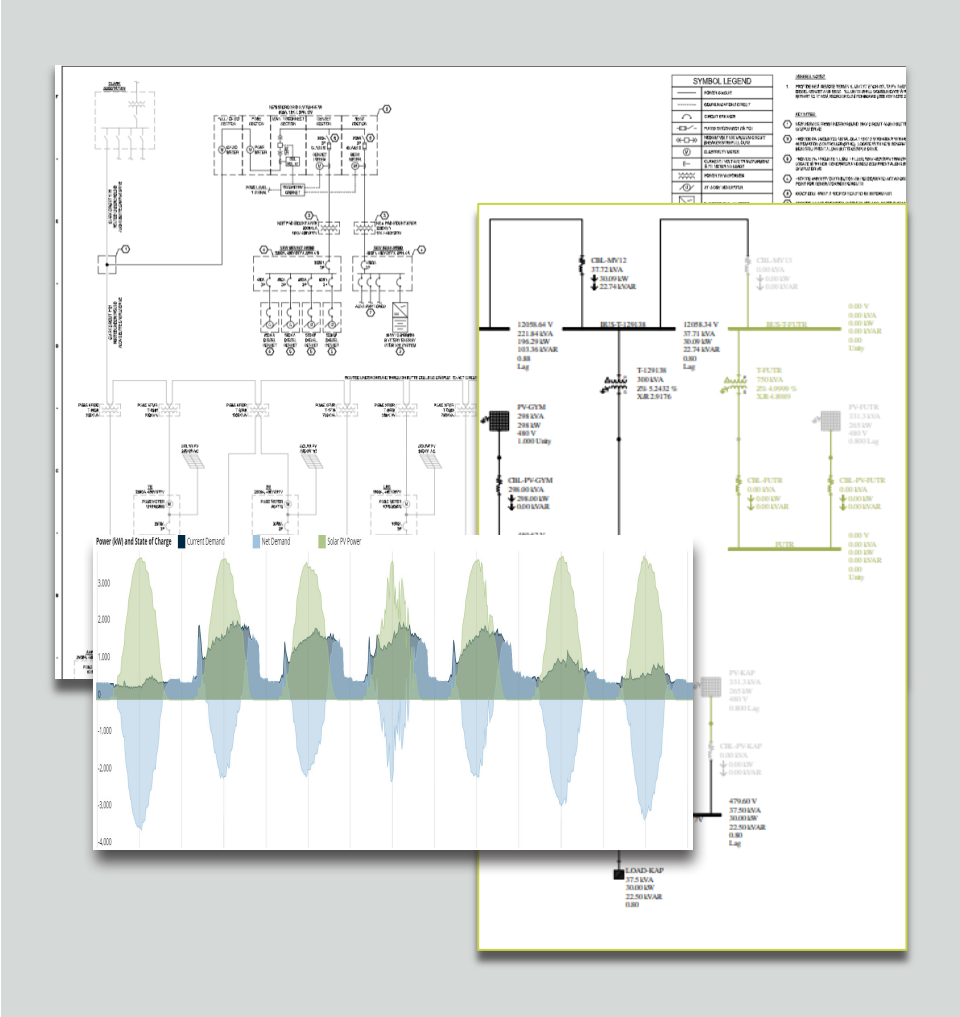
By the Numbers

359,000+ kWh
Annual reductions via EE measures

Nearly $151K
Annual cost savings from EE measures

Eight Iterations Modeled
Battery and back-up generation combinations revealed the most cost-effective solution

Seven Power Flow Scenarios
Modeling determined optimal sizes for microgrid components



Solutions Identified and Prioritized

AESC provided the college recommendations for each option investigated.

Reduce Annual Energy Costs through EE

AESC identified EE measures that, when implemented, could potentially save the campus $150,978 in annual energy costs given expected rate increases. The EE measures included retrocommissioning, LED lighting upgrades, a water-cooled chiller upgrade, and a blower and controls upgrade at the sewage treatment plant.

Interconnection Hub at the Local Substation

The electric utility could allow the distribution feeder that serves the college to island, providing the campus self-sufficiency via an interconnection hub with either a permanent or mobile generator.

On-Campus Microgrid

The AESC electrical and mechanical engineering team designed an on-campus microgrid consisting of a 3MW battery energy storage system, solar photovoltaics to supplement an existing solar system, and a microgrid

controller to manage all generation and storage during islanding and provide load curtailment at other times. While AESC aspires to specify all-renewable microgrids, modeling demonstrated that 1.75 MW of backup diesel generation was necessary to maintain power for three days.

AESC created financial models for both the college purchasing the microgrid and using a power purchase agreement in which the owner-operator participates in the California Independent System Operator market.

Detailed specifications were created for the college to use should they choose to procure the microgrid. The information can be included in a vendor request for proposal, giving the college confidence in the respondents' bids.

Results

AESC's Building Energy Resiliency Planning Services furnished the college with a comprehensive, unbiased view into their energy resiliency options. The college now has the data they need to select the best solution and avoid future outages, providing benefits to the college, their students, and the community at large. College Facility Management staff have shared the findings with their Board of Trustees and are currently pursuing portions of the plan.

About AESC

Founded in 1994, Alternative Energy Systems Consulting, Inc. (AESC) is an EE practice that drives solutions in energy efficiency, renewable energy, and software for utilities, regulators, public entities and private enterprises throughout the United States.

For more information on how this process has helped others, see our case studies at:
www.aesc-inc.com/library/library-case-studies