

Project Demonstrates Capabilities of Urban Microgrids to Increase Resiliency and Reduce Greenhouse Gas Emissions

The goal of this project is to design networked clean energy systems that support financially viable distributed energy resources and control methodologies that benefit both customers and utility providers.



THE CHALLENGE

Nationwide, our electrical power distribution infrastructure is vulnerable to increasing extreme weather events, other natural disasters and cybersecurity threats. With locally sited renewable resources, microgrids provide the capability to operate on the grid to help meet demand, balance intermittent generation sources and reduce greenhouse gas emissions. When isolated and operating off the grid, microgrids can supply power during planned and unplanned outages.

GOALS

Under the leadership of the Sonoma County Junior College District, project team members Center for Sustainable Energy, PXiSE Energy Solutions and Worley are integrating solar generation, electrical energy storage and advanced load reduction and control systems to demonstrate the environmental, economic and resiliency benefits of a highly flexible campus microgrid at Santa Rosa Junior College in California. The project is funded by a nearly \$5 million grant from the California Energy Commission's Electric Program Investment Charge.

TECHNOLOGY SOLUTIONS

This project promotes increased flexibility, resiliency and functionality by demonstrating a microgrid strategy that demonstrates enhanced economic value for distributed energy resources (DERs) and enables adaptive load shed strategies for increased system resilience. The adaptive strategy allows individual buildings to be dynamically disconnected and reconnected to provide resiliency to critical infrastructure and allows the microgrid to be adapted to capital improvements undertaken by the college.

DISTRIBUTED ENERGY RESOURCES

- › Approximately 2.5 megawatts (MW) of solar installations
- › 1 MW/2 megawatt-hours (MWh) of energy storage for demand charge management
- › 2 MW/2 MWh additional storage in two campus locations for islanding transients in power and ancillary services
- › Microgrid controller (PXiSE) providing high speed real-time, closed-loop control of DERs
- › Intelligent load management and submetering

PROJECTED OUTCOMES

- › Strive to achieve 40% of the campus electricity requirement with emissions-free solar power
- › Reduce campus peak load
- › Optimize energy use
- › Providing technical assistance
- › Provide support services to the surrounding grid
- › Create a resilient power system to benefit the campus and local community during disasters, unplanned outages and public safety power shutoffs

ADDITIONAL PROJECT BENEFITS

- › Reduce energy consumption and greenhouse gas emissions
- › Enhance economic value for DER assets and decreased operating costs for the Sonoma County Junior College District
- › Increase system reliability inside and surrounding the microgrid
- › Demonstrate capabilities of microgrid projects across the California Community Colleges system

ADVANCING TECHNOLOGY

This project is pushing microgrid operations to the next level by integrating high-speed localized control, renewable generating sources and various storage technologies, creating a virtual power plant serving multiple load-controlled buildings. The Center for Sustainable Energy can leverage these efforts to apply the strategy at other project sites throughout the state and nationwide. We welcome opportunities to spread microgrid benefits, providing energy resilience, emissions reductions and grid services to local regions.

ABOUT CSE

Center for Sustainable Energy® is a nonprofit with one simple mission—decarbonize. We offer clean energy program administration and technical advisory services, working nationwide with energy policymakers, regulators, public agencies, businesses and others as an expert implementation partner and trusted resource.

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