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SIGI Helps Riverside Public Utility During Peak Historic Demand

UCR Sustainable Integrated Grid Initiative (SIGI)

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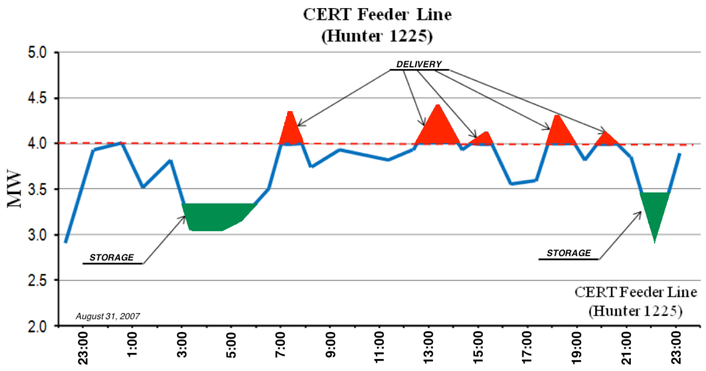
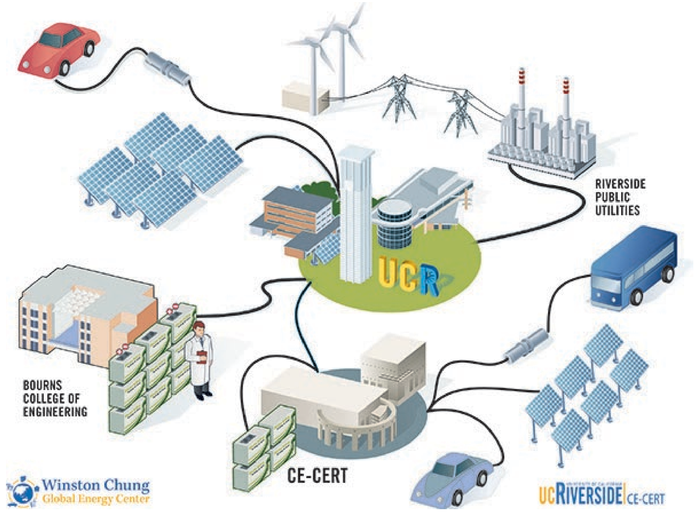
INTRODUCTION

On Monday, September 15, 2014, triple digit temperatures lead Riverside Public Utilities (RPU) to reach a new all-time high electricity demand of 610 megawatts (MW). RPU sent out an appeal to larger customers to conserve electrical energy, especially during peak hours, 2pm to 5pm. UCR CE-CERT's SIGI testbed has the ability to not only curtail a nominal power consumption of 265kW, but also provide 225kW back to the grid, resulting in a 590kW swing for the three hours.



Support Electric Vehicle Charging with PV Generation and Energy Storage

Photovoltaic generation on the UC Riverside campus will be utilized to offset electrical energy utilized throughout the region for Plug-in electric vehicle (PEV) charging events. The PV generation will be linked with stationary battery storage to mange energy needs during period of insufficient PV generation. Energy management will be coordinated with Riverside Public Utilities to optimally reduce peak loads on the electrical distribution network and local power feeders.



Electric Transit

A UCR owned and RTA operated Trolley Bus will be converted from diesel combustion to battery electric operation. Energy use will be continuously monitored. Grid impacts resulting from Fast DC charging of the trolley will be offset with PV generation and battery storage.

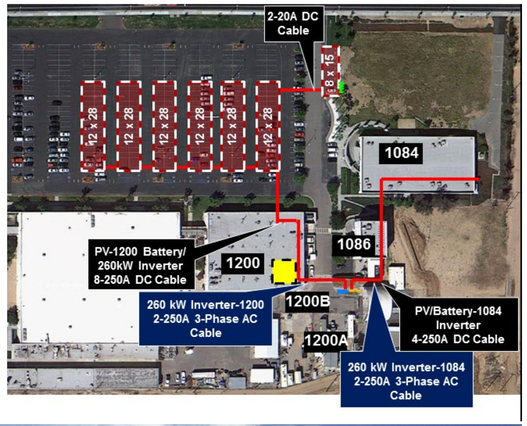
Stationary Battery Energy Storage

2.16 MWh of stationary battery storage will be integrated with the campus facilities and distribution feeders to offset on-site power demand. Batteries will store excess energy during evenings and deliver power during peak events.

Specification	Value
Model	WB-LYP1000AHC
Manufacturer	Winston Global Energy
Nominal Capacity	1000Ah
Max Charge Current	<= 5CA
Max Discharge Current	<= 3CA
Self Discharge Rate	<= 3% (Monthly)
Cycle Life (80% DOD)	>= 5000 Times
Cycle Life (70% DOD)	>= 7000 Times
Operating Voltage Range	2.8V to 3.65V
Nominal Voltage	3.4V
Weight	35kg (~77lbs)
Chemistry	LiFePO4

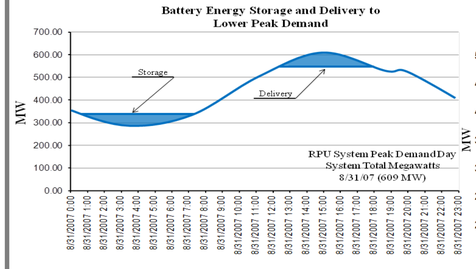
Photovoltaic Generation

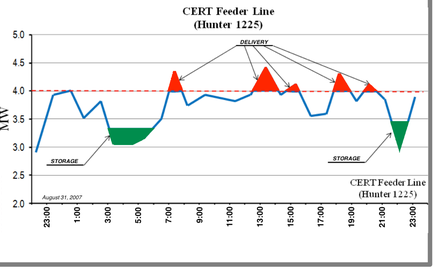
500 kW of photovoltaic power generation is being implemented on the CE-CERT research campus and integrated with energy storage and smart grid monitoring and control. Solar generation will be optimized to reduce peak demand on the local distribution feeder. Facility power usage, monitoring, and control will implement energy optimization strategies for daily power demand.



Smart Grid Energy Monitoring Management and Control

Energy use will be continuously monitored within the research facilities in conjunction with the distribution feeder and the overall utility grid. Smart Grid management decisions will be implemented and utilized to maximize grid stability, reliability, and efficiency. Strategies, protocols, and methods will be explored and documented relative to emissions reductions, cost, and effectiveness while supporting EV charging events.





ACKNOWDGEMENT

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