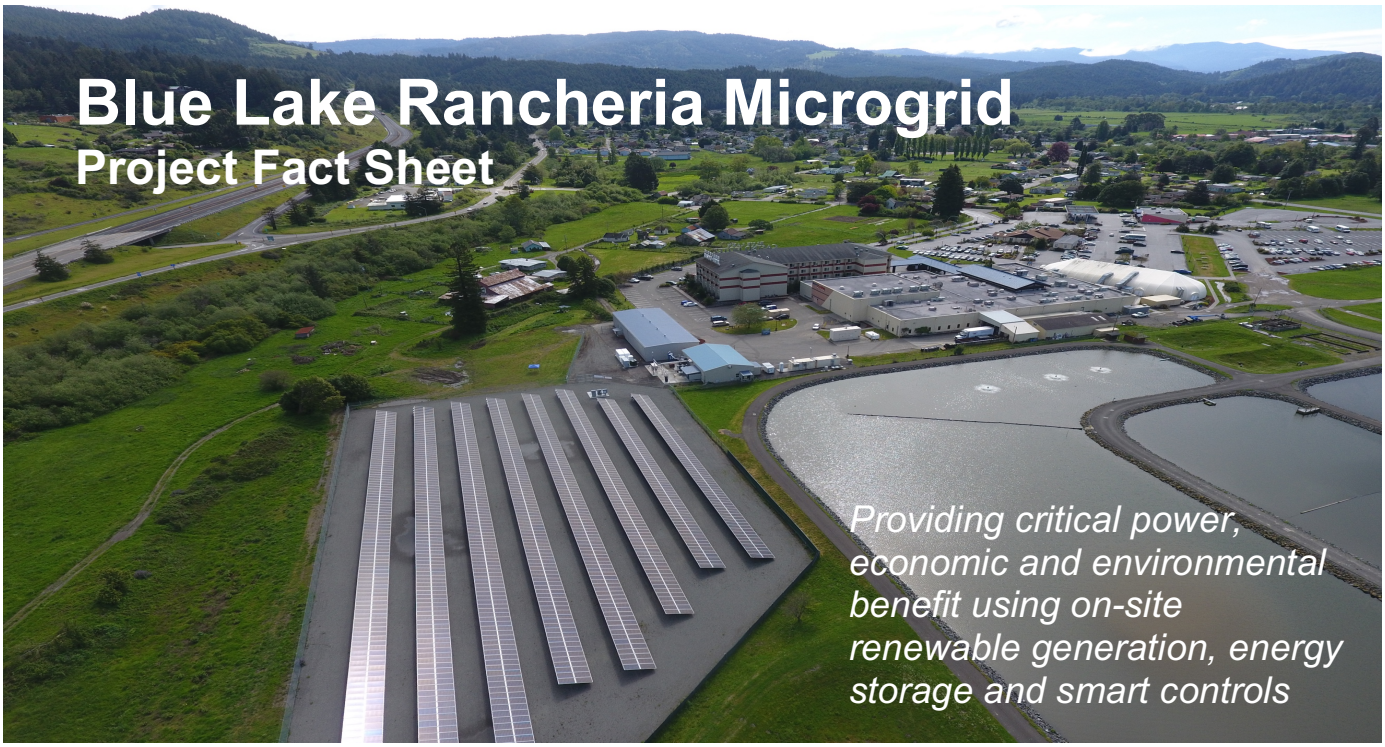
Blue Lake Rancheria Microgrid
Project Fact Sheet



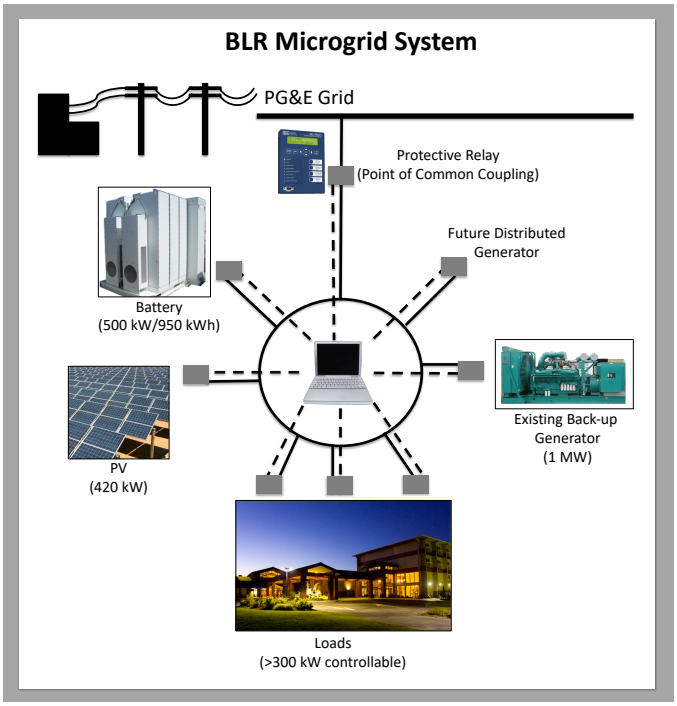
Credit: Blue Lake Rancheria

The Issue

Humboldt County is a natural disaster-prone region of California with a majority of power generation assets in the coastal tsunami zone and constrained transmission from the greater California electric grid. Energy resiliency is a serious concern to the local community, and planning efforts have emphasized a need to expand sources of longer-term backup energy generation at critical facilities.

The Project

Microgrids that deploy renewable power generators and energy storage can increase a community's resilience while also reducing its carbon footprint, providing both climate change adaptation and mitigation benefits. The Blue Lake Rancheria (BLR) Low-Carbon Community Microgrid Project has demonstrated a robust, renewable-based microgrid system that provides critical power during emergencies (including power to a nationally-recognized Red Cross evacuation center), as well as economic and environmental benefits during blue sky conditions.



Component Specifications	
PV System	420 kW, Solar World 325 XL Mono PV modules, SMA TP 30-TL-US-10 inverters
Battery Storage	500 kW / 950 kWh, Tesla Powerpack system w/ Dynapower 250 kW inverters
Microgrid Controller	Siemens Spectrum Power™ MGMS
PCC Protective Relay	Schweitzer Engineering Laboratories SEL-700GT+

Schatz Energy Research Center

THE GREAT TRIBAL SEAL OF THE BLUE LAKE RANCHERIA

System Operation

Blue Sky Conditions

The BLR microgrid runs in parallel with the utility grid. The solar electric generator provides on-site power to offset energy use from the grid, with a special focus on reducing power purchases during high priced periods. Battery storage is used to further offset peak power purchases and reduce peak demand charges. The microgrid can be placed in island mode to respond to demand response events.

Grid-Outage Scenario

When an electric grid outage occurs, the microgrid goes into island mode, continuing to provide power for on-site loads. For short duration outages, the battery can form the grid, with support from the solar generator. In the event of a long duration outage and a low battery state-of-charge, an existing 1 MW back-up generator will form the grid with support from the solar generator. As needed, non-critical loads will be shed to maintain microgrid stability. Planned seamless transitions to and from the grid are possible.

Project Highlights

- Saved $150,000 in 2017, a 25% electricity cost savings; $170,000 of savings are expected in 2018.
- On-site PV power met 15% of the total load and reduced greenhouse gas emissions by 158 metric tons CO_2e; due to operational improvements, a reduction of 170 metric tons CO_2e is expected in 2018.
- Provided reliable, unattended back-up power during numerous grid outages.
- Demonstrated seamless island and seamless reconnection capabilities.
- Demonstrated a foundational control system that provides critical redundancy and allowed for a smooth installation and commissioning period.
- Increased the resilience of a nationally recognized Red Cross evacuation center and demonstrated the ability to island for extended periods.
- Increased Tribal employment by 10% and provided induced and indirect economic benefits.
- Generated extensive media, public outreach and education opportunities. Received FEMA's 2017 Whole Community Preparedness Award and DistribuTECH's 2018 Project of the Year for DER Integration Award.
- Project completed on time and on budget.

Project Specifics

Contractor:	Schatz Energy Research Center, Humboldt State University
Partners:	Blue Lake Rancheria, PG&E, Siemens, Tesla Motors, REC Solar, Idaho National Laboratory, GHD
Funding:	$5,000,000 - Energy Commission Agreement EPC-14-054 $1,318,000 - Match funding from project team
Timeline:	July 2015 – March 2018
Energy Commission Agreement Number: EPC-14-054	
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