California Alliance for Community Energy

A conversation on the opportunities, challenges, and policy recommendations for community-driven microgrids

March 24, 2022
Reimagining the Power Sector

- Boutique consulting firm specializing in microgrids, advanced energy technology, resiliency and sustainability policy

- Headquartered in San Francisco

- Founded in 2019 as solo practice, ending 2021 as team of 5

- Clients include microgrid and clean energy developers, cleantech startups, trade associations, sustainability nonprofits
Microgrids & Distributed Energy Resources

Clean, Affordable, Reliable, Equitable, and Safe
SB 1339 Defines Microgrids in California

◇ “Microgrid” means an interconnected system of loads and energy resources, including, but not limited to, distributed energy resources, energy storage, demand response tools, or other management, forecasting, and analytical tools, appropriately sized to meet customer needs, within a clearly defined electrical boundary that can act as a single, controllable entity, and can connect to, disconnect from, or run in parallel with, larger portions of the electrical grid, or can be managed and isolated to withstand larger disturbances and maintain electrical supply to connected critical infrastructure.

◇ Stern, 2018
California Energy Commission issues grants for microgrids

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2012–2019

November 2018

Camp Fire and wildfires ravage Northern California

Q2 2019

First PSPS events initiated around the state

Q4 2019

CPUC expands microgrid proceeding to include resiliency strategies after major PSPS events

Q3 2019

CPUC opens microgrid proceeding to implement SB 1339

Q1 2020

New microgrid legislation introduced SB 1215

Q2 2020

CEC IEPR to include microgrids

Q3 2020

Track 2 of microgrid proceeding finalized

Q4 2020

Track 3 opens RMWG meetings SB 99 intro’d

Q1 2021

Drive 1 of microgrid proceeding finalized

Q2 2021

Track 2 finalized Track 3 opens RBWG meetings SB 99 intro’d

Q3 2021

Track 3 opens

Q4 2021

Track 4 opens SB 99 dies

2022

MIP workshops Governor Order on Reliability Track 4 opens SB 99 dies

MIP funds to be released Multi-customer microgrid tariff developed

Reliability Decision in Nov MIP plan released Dec

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Emergency Microgrids for Fire Stations

Microgrid Design
- **Solar**: 38 kW solar PV at Fire Station 11, 43 kW each at Fire Stations 6 and 7
- **Energy Storage**: 110 kWh li-ion battery storage at each
- **Software & Controls**: Gridscape Solutions’ cloud-based predictive distributed energy resource management software (DERMS) and energy management system – EnergyScope
- **Technology Integration**: Gridscape Solutions

**UNIQUE PROJECT ASPECTS**
- Displaces diesel generation and extends fuel reserves in emergency, keeping the fire station online longer as a viable first responder
- System design refined over deployments.
- Demonstrated more than 10 hours of islanding capability
- Gridscape expanding to other communities
EcoBlock: A Multi-Customer Microgrid Solution

California Energy Commission EPIC project
Phase I (2015-2018) $1.5M
Phase II (2019-2023) $5M

Unique features:
Retrofits of older housing stock on an existing block, combining deep efficiency with 100% solar PV microgrid

Innovative legal and financial structures:
Community ownership and management via nonprofit Co-op or trust; Financing via Community Facilities District (CFD)

Beneficiaries:
Project aims to prove affordability for low-to-middle income neighborhoods; Scale-up potential is key
EcoBlock Vision: A Multi-Customer Microgrid Solution

**Electrical system combines DER**

- Communal rooftop solar PV
- Communal energy storage system (flywheel and/or battery)
- Intelligent loads and electric demand response
- Shared Electric vehicle (EV) charging
- Smart controls in a direct-current (DC) microgrid infrastructure

**behind a single interconnection with PG&E**
Public Utilities Code 218

“Over the Fence” Rule

- Defines what is and is not an “Electrical Corporation”
  - Any entity wishing to distribute power to more than 2 contiguous properties or across a public street for compensation must become an electrical corporation subject to regulation and oversight by the CPUC

- Exemptions:
  - Cogeneration (SB 1773 in 1984)

- CEC Pilot Projects Facing Challenges
  - Oakland EcoBlock
  - Lancaster Advanced Energy Community
  - Port of Long Beach – Rule 18 issues

PUC 218 will likely need to be changed in order to realize the full potential of community microgrids!
Community Microgrid at Blue Lake Rancheria

Microgrid Design
Solar: 420 kW AC PV ground-mounted array
Energy Storage: 500 kW / 950 kWh lithium-ion battery storage
Software & Controls: Siemens Spectrum Power 7 Microgrid Management System and Schweitzer Engineering Laboratories Protection Relays
Other Infrastructure: Purchased distribution system infrastructure to create a new point of common coupling with the grid, integrating six buildings into the microgrid behind one electric meter
Technology Integration: The Schatz Energy Research Center at Humboldt State University

UNIQUE PROJECT ASPECTS
✓ American Red Cross shelter
✓ Successfully islanded during several unplanned utility outages due to weather and nearby wildfires
✓ Can deploy five levels of load shedding depending on the outage and system conditions
✓ Achieving cost savings: 58% overall energy
This is the ideal community microgrid design framework.

Figure 2. Blue Lake Rancheria low-carbon microgrid components.
Community Microgrid Policy Recs

Change PUC 218 to exempt microgrids owned and controlled by communities

Create a Community Microgrid Operator (CMO) designation and framework

Allow CMOs to develop microgrids with master metering that cross rights of way and serve multiple customers

Develop tariffs and rates that promote local electron sharing between neighbors

Create interconnection procedures to streamline development and ease admin for applicants
Thank You!

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