

DOCKETED

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Front of Meter Distributed Energy Resources: The Redwood Coast Airport Microgrid...and Beyond

For California Energy Commission's
Distributed Energy Resources in
California's Energy Future Workshop
July 15, 2026



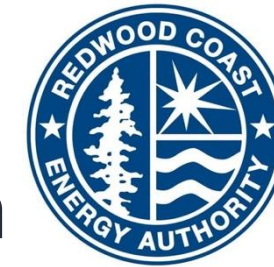
Project Description

- First front-of-meter, multi-customer microgrid on PG&E's system
- 2.2 MW PV array DC-coupled to 2.2 MW/8.8 MWh battery storage → CAISO wholesale market participation
- 320 kWAC net-metered PV array → reduce airport electric bills
- 2 MW of wholesale power feeds clean energy directly into the grid
- 2 MW battery storage system providing 8 MWh of energy storage



Airport Microgrid Project Partners

- Redwood Coast Energy Authority: local CCA, distributed generation owner & co-funder
- Schatz Energy Research Center: prime contractor & technology integrator
- Pacific Gas & Electric: Grid innovation team, distribution system operator
- California Energy Commission and PG&E Electric Program Investment Charge (EPIC): grant funders
- County of Humboldt: airport owner/operator
- TRC Companies: business case, cybersecurity
- Key Vendors: Tesla (PV/battery) Schweitzer Engr. Labs (controls, software), TEA (CAISO market participation)



Project Objectives

Community Focus

- Renewable energy projects create jobs, keep energy dollars local, increase energy security, reduce price volatility, increase local control & ownership
- Reduce greenhouse gas emissions
- Provide resilience to essential services, including regional airport and Coast Guard station

Utility & Ratepayer Focus

- Design and install first front-of-the-meter, multi-customer microgrid in California
- Demonstrate a viable, replicable business model for a 100% renewable community scale microgrid
- Develop agreements, standards and processes for replicability



Source: US Coast Guard

Project Challenges

What could go wrong with building the first ever DC coupled, front-of-the-meter, multi-customer microgrid, as a collaboration between a CCA and an investor-owned utility, and then use USDA financing for RCEA's first CCA project as well as the first microgrid USDA ever financed, and doing that at an airport in the middle of a global pandemic?

Matthew Marshall

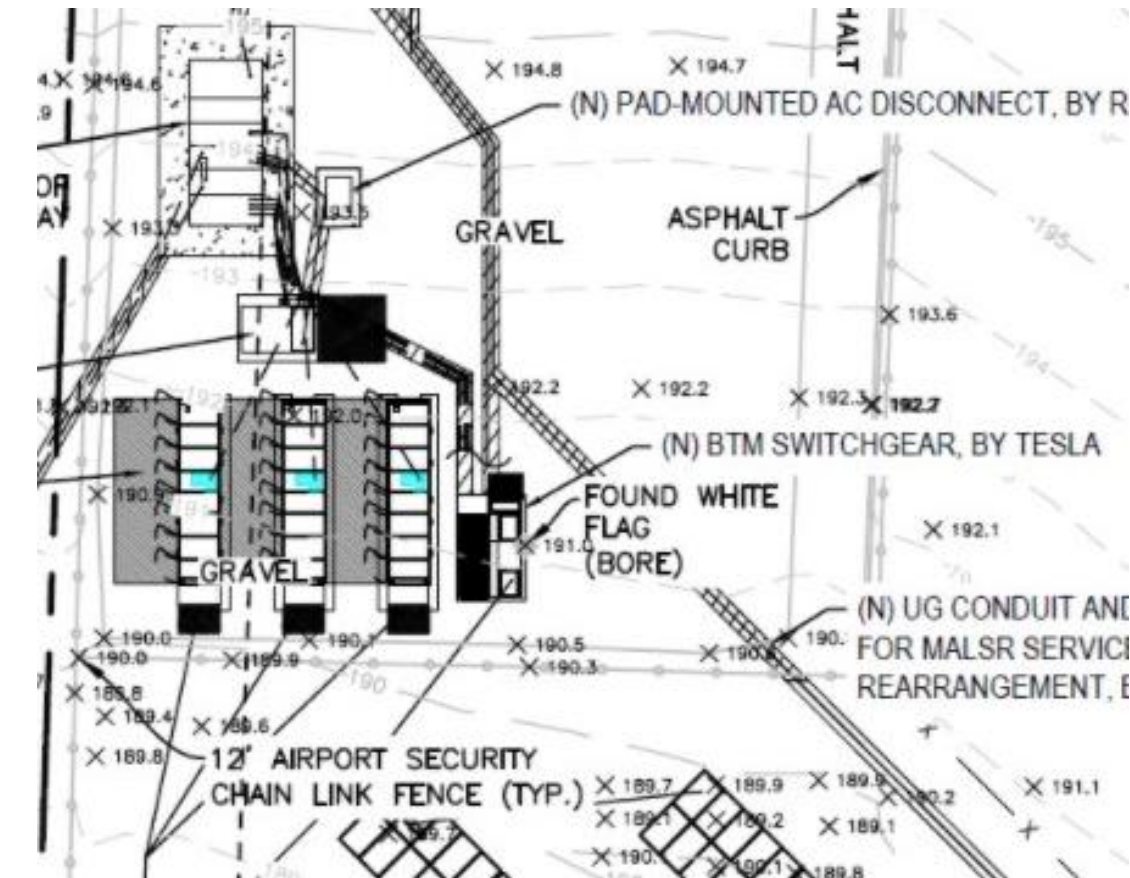
Former RCEA Executive Director



What we would do differently



- More/earlier scrutiny for complications:
 - Local, state, federal
 - Cultural and historical requirements
 - Environmental and coastal compliance
- Take a hard look at interconnection: years later, we are still working on getting full capacity deliverability status to realize resource adequacy in the project's financial value stack
- Plant capacity factor: what is your real run-time considering maintenance, outages?
- Who will operate and maintain this LSE-owned project long term?
- Budget for media, tours, industry events
- Value of resilience: build consensus early



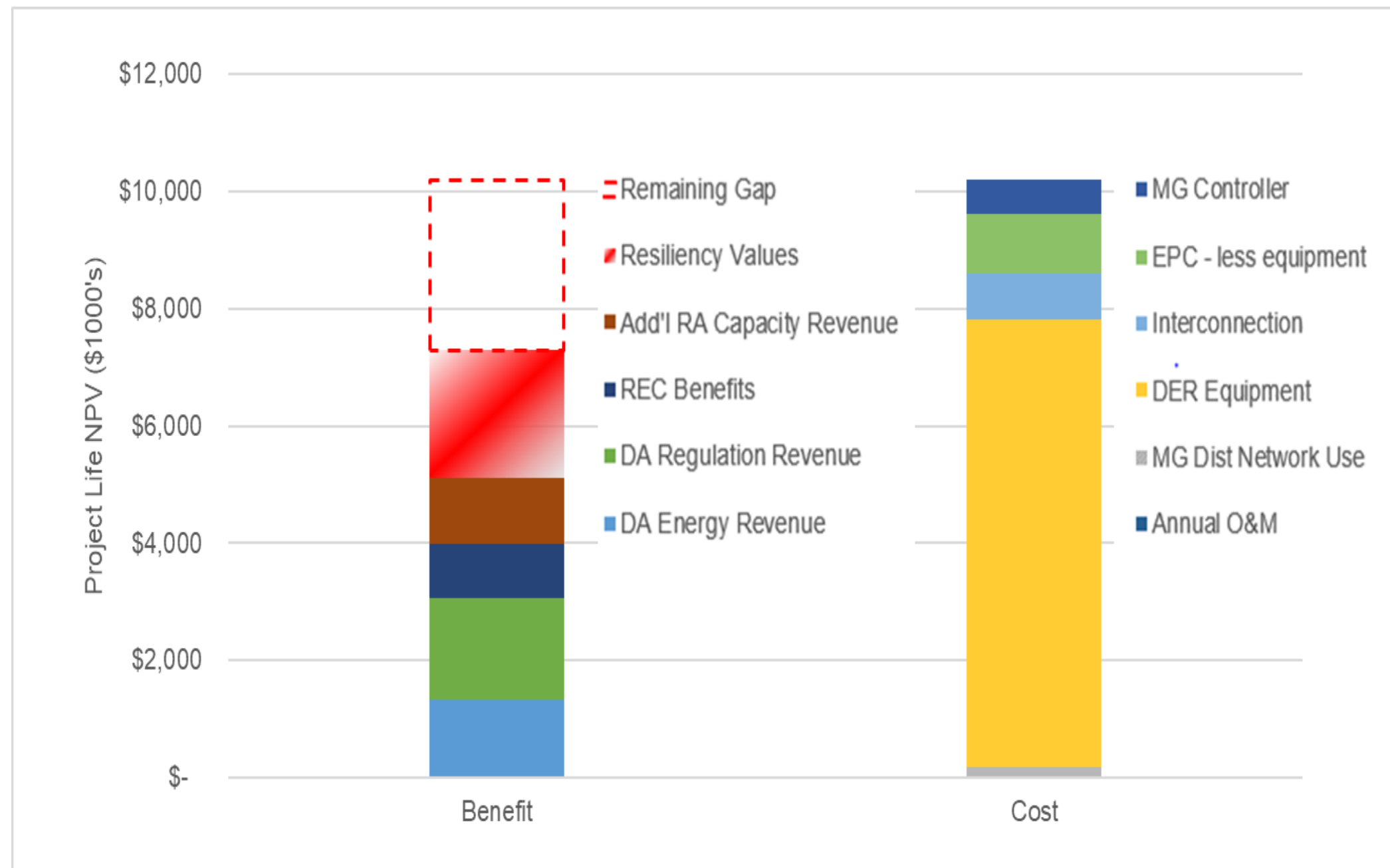
Economic Performance



\$2.2M
RESILIENCY VALUE

0.71
BENEFIT / COST (25 YEARS)

\$2.9M
REMAINING GAP



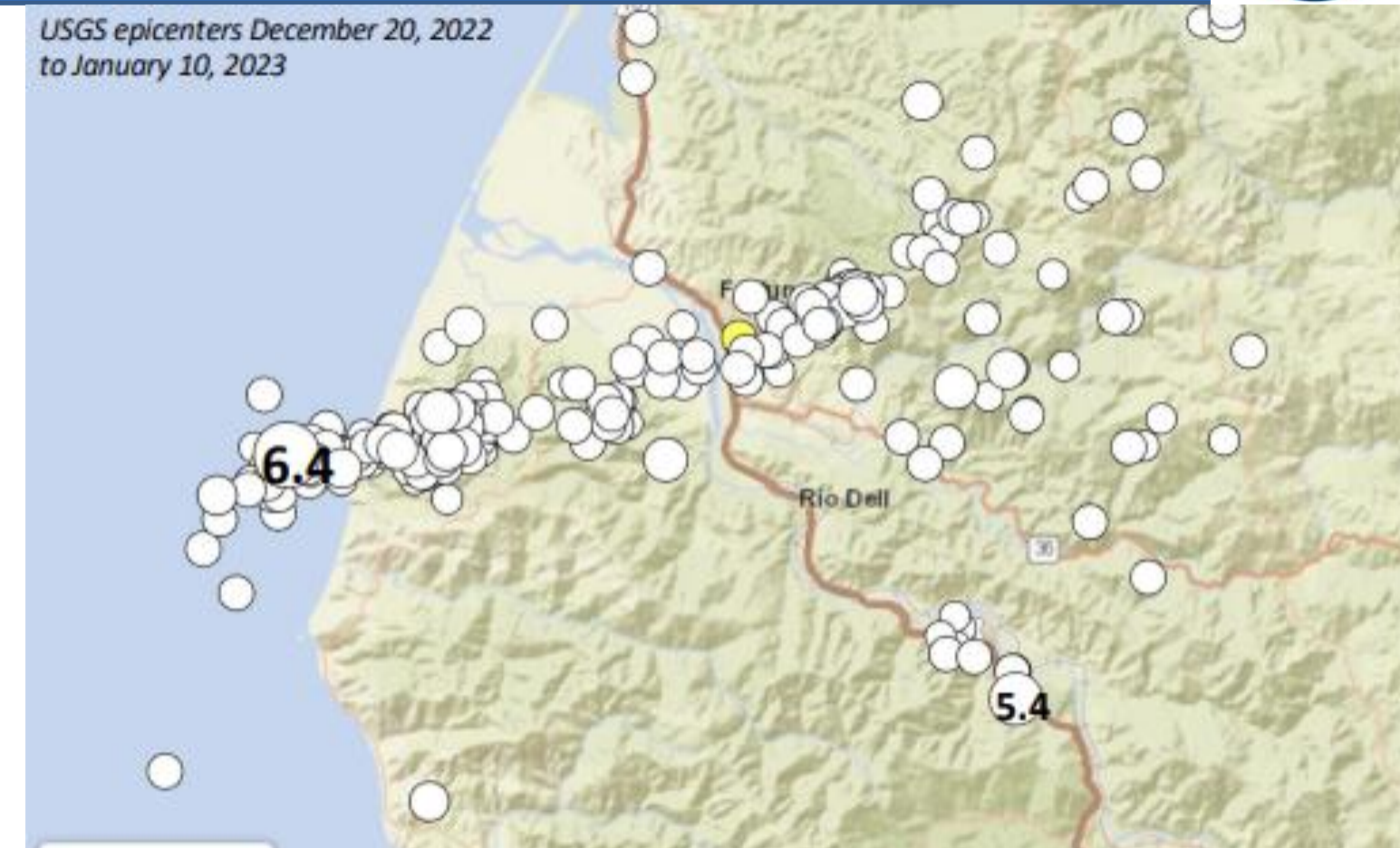
Costs and Benefits

- Costs (actual and estimated)
- Wholesale market revenue (TEA, NREL)
- Resiliency value (TRC modeling)
 - Loss of service & revenue
 - Loss productive time (worker GDP)
 - Customer interruption cost
 - Determined using accepted models (FEMA Benefit-Cost Analysis Re-engineering methodology, Interruption Cost Estimate Calculator)
- Remaining gap made up by many additional benefits (added resilience, job creation, local energy control)

Retrospective: is it worth it?



- Real-world test: Magnitude 6.4 earthquake
 - 72,000 utility customers without power
 - RCAM had low batteries after evening's energy sales
 - Second shortest day of the year
 - Stormy weather
- RCAM Powered airport and Coast Guard for 15 of 16 outage hours
- 12 atmospheric river events in following weeks: RCAM managed most of them



Sent: Tuesday, December 20, 2022 2:20 PM
"RCAM looks to have picked up pretty much seamlessly when the county went out, and despite the outage occurring at more or less the worst possible hour of the year (just after evening peak discharge, near the solstice, with bad weather), has been running smoothly since."

Image source: Earthquake Country Alliance SoCal Workshop 2/22/23

RCEA and microgrids: what comes next?



- Blue Lake Rancheria, Hoopa Valley Tribe and Yurok Tribe are looking to build a network of Tribally owned and operated community microgrids.
- RCEA has assisted in identifying funding for these projects.
- As with RCAM, Schatz Energy Research Center at Cal Poly Humboldt to act as technical lead
- Will support the Hoopa 1101 circuit, which experiences some of the most frequent and longest-duration power outages in the state

THANK YOU

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