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Reliability & Equity at Blue Lake Rancheria



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BLUE LAKE RANCHERIA

A Federally Recognized Tribal Government



BLR Tribal Government Resilience Strategy

🌐 Climate-smart infrastructure

- 🚫 Energy :: Water :: Food :: Transportation :: Communications/IT (the “lifeline sectors”)
- 🚫 Improved continuity of operations, community health, resilience (reliability + equity)
- 🚫 Economy-enabling infrastructure and investment; lower, predictable costs

🌐 Zero-carbon solutions

- 🚫 Pairing climate mitigation + adaptation = net zero greenhouse gas emissions by 2030



Low-carbon Microgrids at Blue Lake Rancheria

- Community scale – in operation since 2017
- Facility scale – in commissioning, full operation 11/2019
- Campus scale – in design, full operation by Q4 2020, will include residences
- Three nested / clustered microgrids allows for ongoing reliability studies



Community Microgrid

- 🌐 Public/private partnership
 - 🔴 Blue Lake Rancheria, Schatz Energy Research Center, PG&E, Siemens, Tesla, CEC, CPUC, Idaho National Laboratory, others
 - 🔴 Funded by the Tribe and a CEC EPIC R&D grant
- 🌐 Powers a 6-building campus
 - 🔴 Tribal government offices, economic enterprises
 - 🔴 Critical infrastructure, lifeline sectors
 - 🔴 Can seamlessly island and reconnect to grid
- 🌐 Generation and storage
 - 🔴 420kW (AC) solar PV
 - 🔴 2MWh battery storage
 - 🔴 Legacy gensets (only used in emergencies)



Facility Microgrid “Solar+”



- ⊗ Microgrid public/private partnership
 - ⊕ Blue Lake Rancheria, Schatz Energy Research Center, PG&E, SunPower, Tesla, CEC, Lawrence Berkeley National Laboratory, others
- ⊗ At fuel station / convenience store complex
- ⊗ Solar PV (60kW) + battery storage (106kw/169kwh) – clean energy
- ⊗ Can island from, and reconnect to, the larger grid
- ⊗ Advanced building controls – efficiency, demand response, grid balance
- ⊗ Creates a replicable, low-carbon ‘resilience package’
- ⊗ In BAU: lowers costs, GHGs, improves COOP
- ⊗ In emergencies:
 - ⊕ Supply lifeline sectors to public; emergency responders
 - ⊕ Important in areas where these facilities are the only community resource for lifeline sectors and critical infrastructure.

Climate-smart infrastructure is working

- ❁ Public Safety Power Shutoff 10/9/19
- ❁ Served ~10,000 people (~10% of County)
- ❁ Supplied general public & response agencies
 - ❖ Fuel, ice, water, food, internet access, device charging, ATMs
 - ❁ Fuel for local clinic to keep medicines cold
 - ❁ Fuel for local fish hatchery to keep fish alive
 - ❖ Electric Vehicle (EV) charging
- ❁ Provided critical medical housing in hotel
 - ❖ Credited with saving four lives
- ❁ Community Support Center
- ❁ The PSPS did its job – no wildfires
- ❁ The microgrids did their job – regional support



Key Recommendations

- ❁ **Climate crisis is causing chronic emergency conditions and social/economic disruptions**
 - 🚫 Disadvantaged and vulnerable communities are often impacted first and worst
- ❁ Out of time for “bridge” energy – RPS should include only zero emission solutions
 - 🚫 Zero emissions in operation; ideally zero net carbon emissions per lifecycle analysis
- ❁ Continue solar and wind at all scales
 - 🚫 Job creation is unparalleled, important in rural environments
 - ❁ U.S. Bureau of Labor Statistics forecasts the two fastest growing U.S. jobs through 2026 are solar installer (105% growth) and wind technician (96% growth) <https://www.bls.gov/ooh/fastest-growing.htm>
 - 🚫 Relatively inexpensive, lower immediate environmental impacts, ability to lower GHGs dramatically
 - 🚫 Solar lifecycle analysis – very low or zero/negative carbon as of ~2018
 - ❁ <https://www.theatlantic.com/science/archive/2016/12/the-solar-industry-has-paid-off-its-carbon-debts/510308/>
 - 🚫 Offshore wind – world-class resource and high capacity factor on the North Coast of California



Key Recommendations

- ⊗ Support paired wind/solar + storage
- ⊗ Support distributed storage
 - ⊗ Humboldt County has locations with larger legacy power transmission systems but smaller land footprint
 - storage farms could work at these locations for reliability and RA
- ⊗ Remove biomass-to-electricity and other emitting sources from RPS
 - ⊗ Relatively high cost, burden for ratepayers
 - ⊗ Creates toxic hot spots in terms of air and/or water pollution
 - ⊗ Health impacts from PM 2.5 and other pollutants
 - ⊗ Plants often aged and located adjacent to disadvantaged communities
 - ⊗ Price competition (with wind/solar +/- storage) does not leave enough \$\$ for BACT and BARCT
 - ⊗ Inaccurate carbon accounting likely obscures / prevents achieving RPS goals
 - ⊗ Climate forcing pollutants must be eliminated



Key Recommendations

- Support zero emission microgrids for stacked co-benefits
 - Jobs, climate, pollution reduction, resilience
 - Need to work on how microgrid resilience is valued
 - In BAU and emergencies; to spur cost-effective development and rapid implementation
 - Need analysis of how to best manage microgrids
 - Regional expertise capacity, safety
 - Need microgrid knowledge transfer
 - Avoid inappropriate technology, increase standardization, lower capital and O&M costs





Conclusion

- Unprecedented era of state/tribal collaboration
 - Energy, transportation, telco
 - Emergency preparedness
 - Climate mitigation
 - Private sector is joining
- Bold**, climate-smart actions are needed and are already successful
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