

# Redwood Coast Airport Renewable Energy Microgrid

Multi-customer, front-of-the-meter, critical facility microgrid

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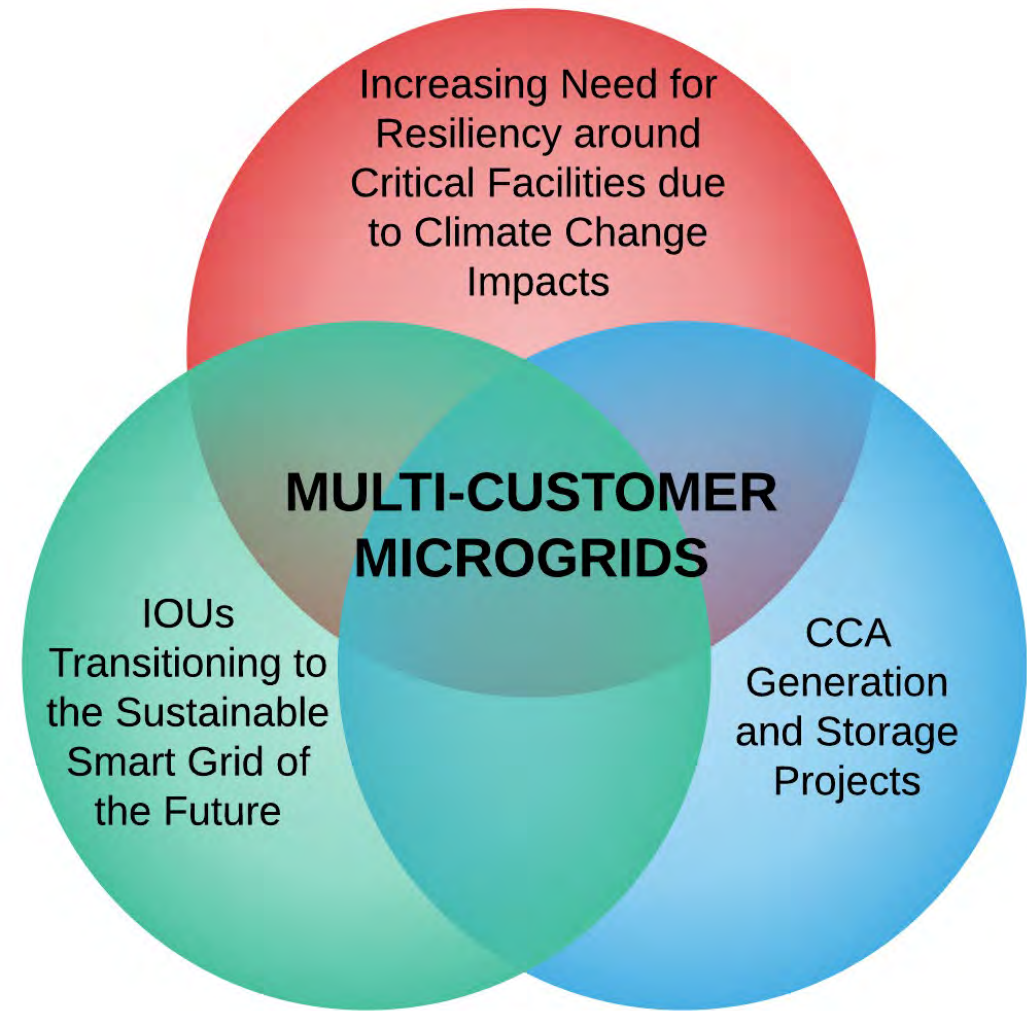
August 25, 2020

CPUC Alternatives to Diesel for Substation Power During PSPS in 2021



Demonstrate a viable, replicable business model for a community-scale microgrid that:

- provides resilience to critical community services.
- develops standard processes to integrate multi-customer microgrids into utility operations.
- allows for greater penetration of distributed renewables
- reduces greenhouse gas emissions



# Project Description



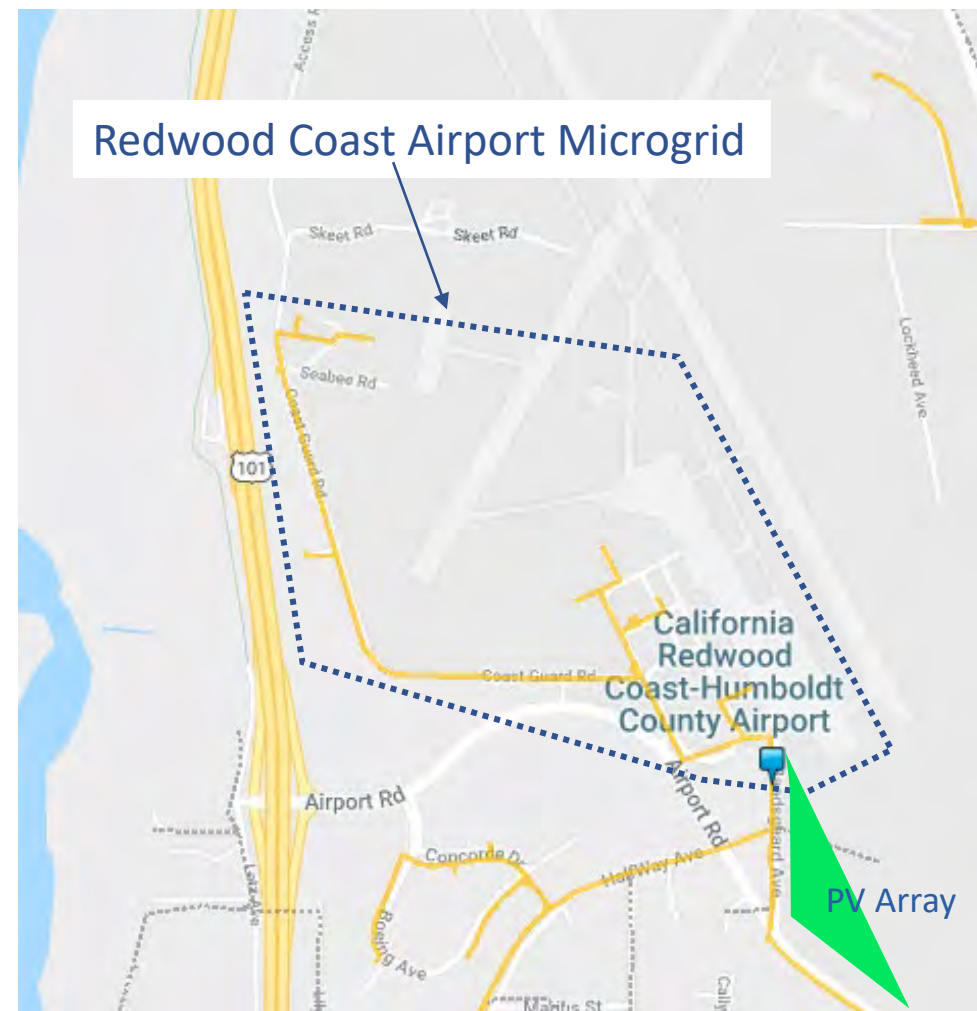
- First 100% renewable, front-of-meter, multi-customer microgrid on PG&E's system
- 2.2 MW PV array DC-coupled to 2.2 MW/ 8.8 MWh battery → wholesale distribution tariff (WDT) interconnection, CAISO market participation
- 300 kW<sub>AC</sub> net-metered PV array → will reduce airport electric bills, land lease compensation
- Microgrid controls → will allow the system to island and provide renewable, uninterruptible power nearly indefinitely



# Project Description



- Edge of Janes Creek 1103 distribution circuit
- Microgrid circuit includes 20 retail accounts, 330kW peak load.
- 19 unbundled CCA customers, 1 bundled PG&E customer
- Key customers:
  - California Redwood Coast-Humboldt County Airport
  - US Coast Guard Air Station



Source: adapted from PG&E Integration Capacity Analysis Map

## Grid-connected Mode

- RCEA (3<sup>rd</sup> party) will control generation asset, participate in CAISO markets → energy arbitrage, frequency regulation
- Wholesale interconnection constrained to 1480 kW max charge and 1778 kW max discharge to mitigate otherwise required system upgrades

## Islanded Mode

- PG&E as DSO will control 12kV circuit, RCEA as GSO will control FTM grid forming generation, BTM PV curtailment and EV charging load shed

**Normally automated with manual mode options**



# Key Challenges



1. Cybersecurity requires maintaining a “Bright Clean Line” between RCEA and PG&E equipment. This results in more complicated controls than would otherwise be necessary.
2. When islanded with only inverters, distribution system fault protection is difficult. Protection cannot be based solely on current-based elements.
3. The presence of bundled and unbundled customers inside the electrical boundary of the microgrid complicates tariff structures for islanded operations.



1. The Redwood Coast Airport Microgrid project will demonstrate that energizing a section of the distribution feeder with renewable energy during PSPS events is doable.
2. We have faced numerous challenges in getting our system designed and permitted. They have required significant time and effort.
3. Scaling our microgrid concept up to substation level will have further challenges of cost and land availability in addition to the challenges we faced.



An aerial photograph showing a long runway and taxiway system. The runway is dark asphalt with white markings. To the right, there is a sandy beach and the ocean with waves. The surrounding area includes some residential buildings and greenery.

# Thank You

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