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Energy Resilience and ZEV

California Energy Commission Workshop on Zero Emission Vehicle Resilience and Three Revolutions in Transportation

7/15/2020

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Tribal Gov’t “Climate-smart” Resilience

- Build “Climate-smart” infrastructure across lifeline sectors
  - Energy
  - Water
  - Food
  - Communications/IT
  - Transportation
    - Biodiesel manufacturing
    - ZEV charging stations
    - Transition government fleet to ZEV
    - Community/employee/low-income ZEV programs

- Achieve zero net greenhouse gas emissions by 2030
- Support community and economy with resilient, reliable, clean infrastructure.
Microgrid Details

- Two microgrids in operation (more in development)
  - Community scale – powers government offices, economic enterprises, lifeline sectors
  - Facility scale – powers fuel station / convenience store complex
- Both have solar PV + battery storage backbone generation w/ smart controls
  - With legacy gensets for deep emergency back up
- Both seamlessly island from the larger grid
- Both microgrids have ZEV level 2 charging
  - 4 ports now; another 10 ports by ~11/2020
- Funding mix: Tribe, EPIC, SGIP, CALeVIP, Partner match
- Public / private partnerships
Climate-smart infrastructure is working

- Public Safety Power Shutoff (PSPS)
  - 10/9/19 - served ~10% of the region

- Electric Vehicle (EV) charging
  - Provided direct charging for the region
  - Many residential and regional EV chargers non-functional due to lack of back up power
  - Enabled vehicle-to-grid functions

- The PSPS did its job – no wildfires

- Microgrids did their job – regional support for electrified transportation
Wildfire Outages + Microgrid Reflections

- PSPS outages were relatively short
- If outages would have lasted longer, there would have been other issues
  - Cellular / internet communications outages - which impacts ZEV charging station functions (data, customer billing, coordination with electrical systems)
  - Limitations to longevity and availability (per day) of back up power in some cases
    - Reliant on local generation and supply chains
- Mega-wildfires and related grid outages predicted for the next decade

2017 wildfire adjacent to Blue Lake Rancheria
Photo credit: CalTrans
Microgrids as ZEV Solutions

Microgrid design considerations for ZEV charging
- Trickle and level 2 chargers - manageable in microgrids
- Fast chargers - design challenges (big power use / spikes)
- May need to control charging volumes as load shed strategy
  - When islanded

How to best manage microgrids w/ ZEV charging infrastructure operationally and economically?
- Expertise/capacity; Ensure safety
- Grid ecosystem benefits – vehicle-to-grid, demand response
- Economies of scale – rates, apps/signage, O&M, IT networks
- Utility / CCA owned and operated?

How are ZEV microgrids valued; how do we fund them?
- Business as usual vs. in emergencies
- Broad/public vs. narrow/private benefits