PARTNERSHIPS FOR MISSION ASSURANCE

Fred Meurer-Moderator

Mr. Christopher Thomas- Army G-9

Col. Lisa Lamb-Garrison Commander(FHL)

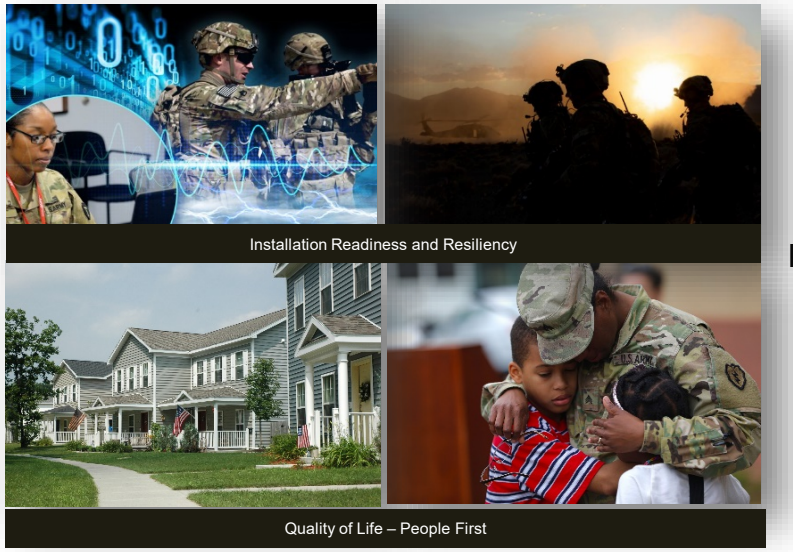
Mr. Jarrod Ross-Energy Manager(FHL)

Mr. Ned McKinley- G-7 Marine Corps Installations (West)

Control Systems Governance Office

G-9 Mission

The DCS, G-9 administers the II PEG, leads the Army's Quality of Life effort, implements, integrates, supervises and assesses execution of policies, resources, plans, and programs for the Installation Enterprise to enable ready, prompt, and sustained land dominance by Army forces.



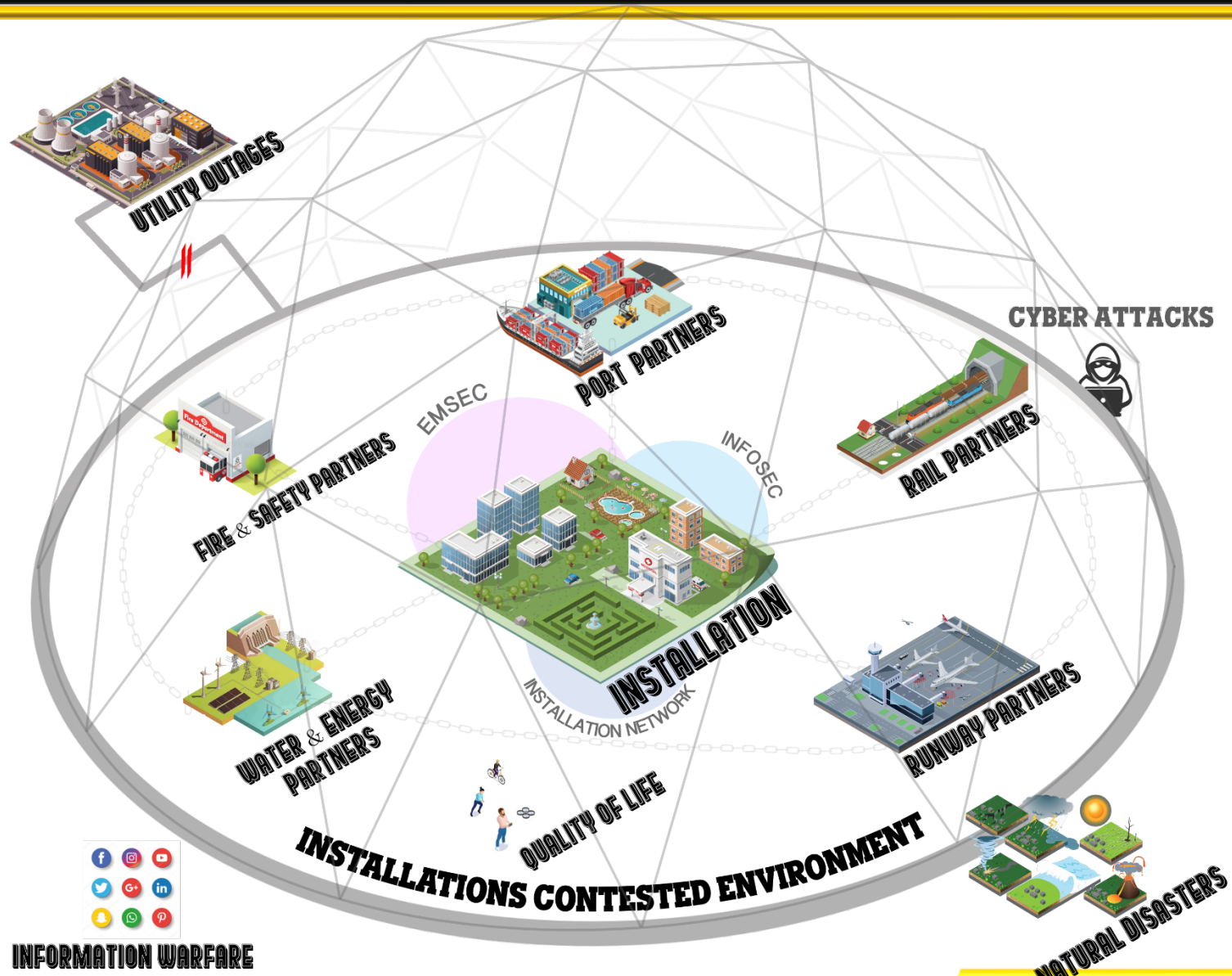
G-9 Vision

Professional experts championing Installation Enterprise Readiness and delivering unmatched Quality of Life to our People.

Mr. Christopher Thomas
Director, Information and Technology, DCS G-9

2 NOVEMBER 2021

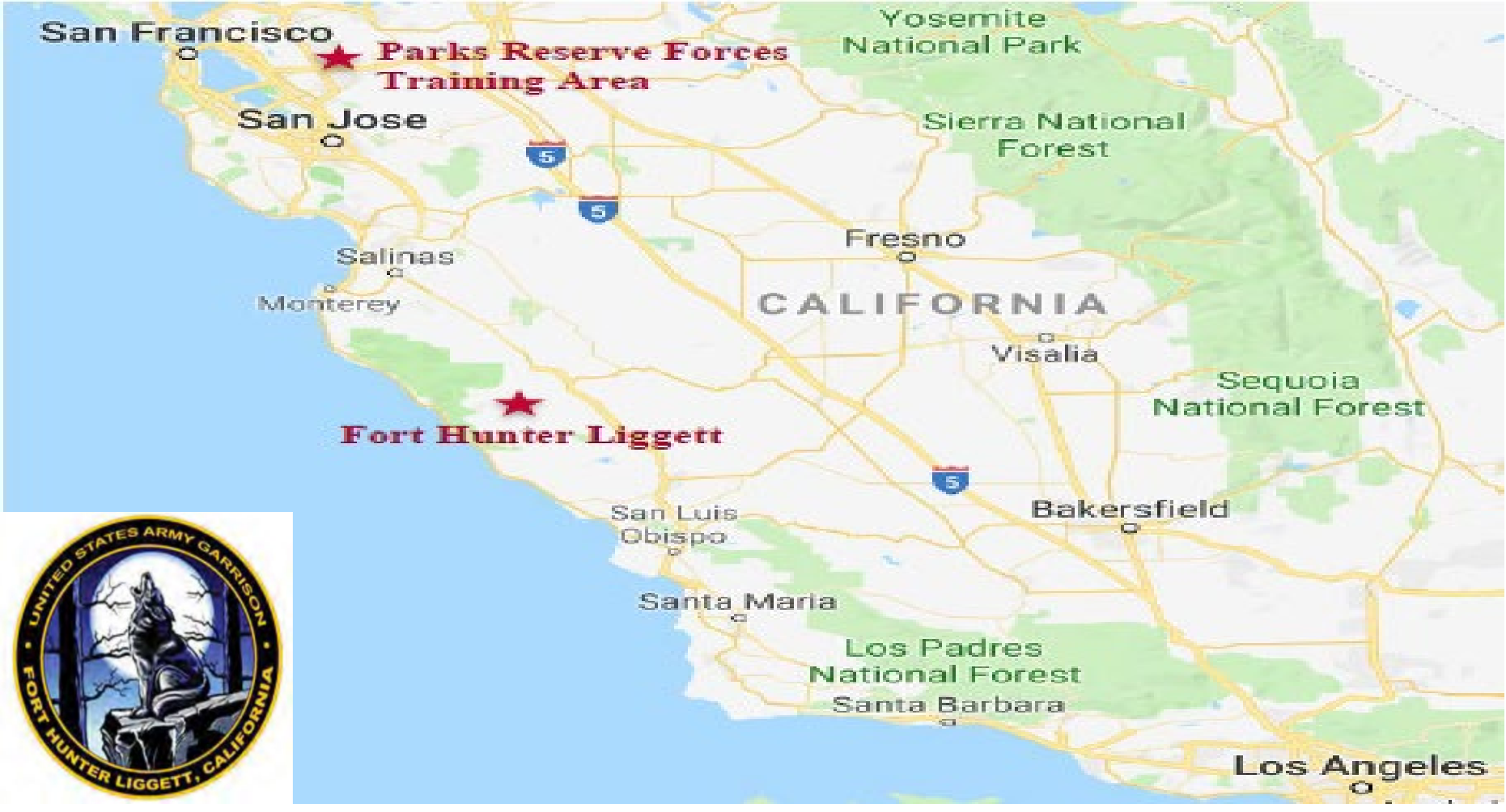
U.S. Army – Fort to Port to Fight



Pathway to Mission Resilience
USAG Fort Hunter Liggett
2 November 2021

Lisa M. Lamb
Commanding
U.S. Army Garrison
Fort Hunter Liggett

USAG FHL/PRFTA LOCATION



A Decade of Planning and Efforts

How it began:

- FHL is remote and isolated; extensive Utility disruptions
- In 2008, FHL determined Renewables based Microgrids were the best option to achieve Energy Assurance for both installations
- FHL and PRFTA were Designated by ASA (IE&E) as Net Zero Pilot Installations in 2011
- Ground-breaking events in 2021

Technology and Efficiency Strategies:

- Heat Pumps for HVAC and DHW Improve Efficiency & Reduce Fossil Fuels
- Centralized Building Controls Monitoring
- Geothermal HVAC & DHW Upgrades to 81 FHL Housing units, $4.5M (FY19-20)
- Sierra Energy ESTCP (FY16) for demo. of 10tpd Municipal Waste Gasifier (FHL)

Infrastructure Upgrades:

- Aging electrical distribution Infrastructure was identified for upgrade at both installations, to support the future Distributed Energy Assets
- PV Generation Installed, FHL 3MW (FY12-15), PRFTA 2MW (FY14)
- Battery Energy Storage Systems installed, FHL 1.2MWh (FY15), PRFTA 4MWh (FY22)

Path Forward:

- PRFTA Microgrid Node #1, $5M CEC Grant, (2Q FY22)
- FHL ERCIP Microgrid $21M, (1Q FY23)
- FHL ERCIP Secondary Wastewater Treatment Plant $10.2M, (4Q FY22)
- UESC for Water Microgrid and expanded BESS to be awarded for FHL (FY22)

The Challenges of Sustainment

Execution and Construction:

- Contracting process is somewhat cumbersome
- US Army Corps of Engineers (USACE) districts Subject Matter Experts (SME) in Energy Resiliency
- A&E firms do not always design projects consistent with Installation Energy Strategies

Sustainment Funding:

- New technologies save energy, save money, and improve resilience, but cost more to maintain
- Privatization Concerns
- USACE metering and building controls for Microgrid, PV, BESS, and Prime Power projects

O&M Practices and Training:

- Garrison staff may lack qualification to operate New Technology Systems (VRF, PV, BESS, DDC)
- O&M Personnel qualifications to maintain New Energy Systems
- Existing M&S contract structure makes collaboration on service and repair efforts challenging

Staffing:

- Authorized positions on TDA needed (i.e. Energy Manager, Microgrid Operator)
- Updates to O&M Hiring practices are needed
- Manpower study to determine staffing for Resilience Projects

Thanks to our Partners!

USAG FHL would like to thank all the partners, programs, and advisors that have supported the installation over the years.

Intellectual Partnerships have been the
Backbone of the Resilience Process

FEMP Federal Energy Management Program

ESTCP

US Army Corps of Engineers

State of California Energy Commission

Pacific Northwest National Laboratory

Berkeley Lab

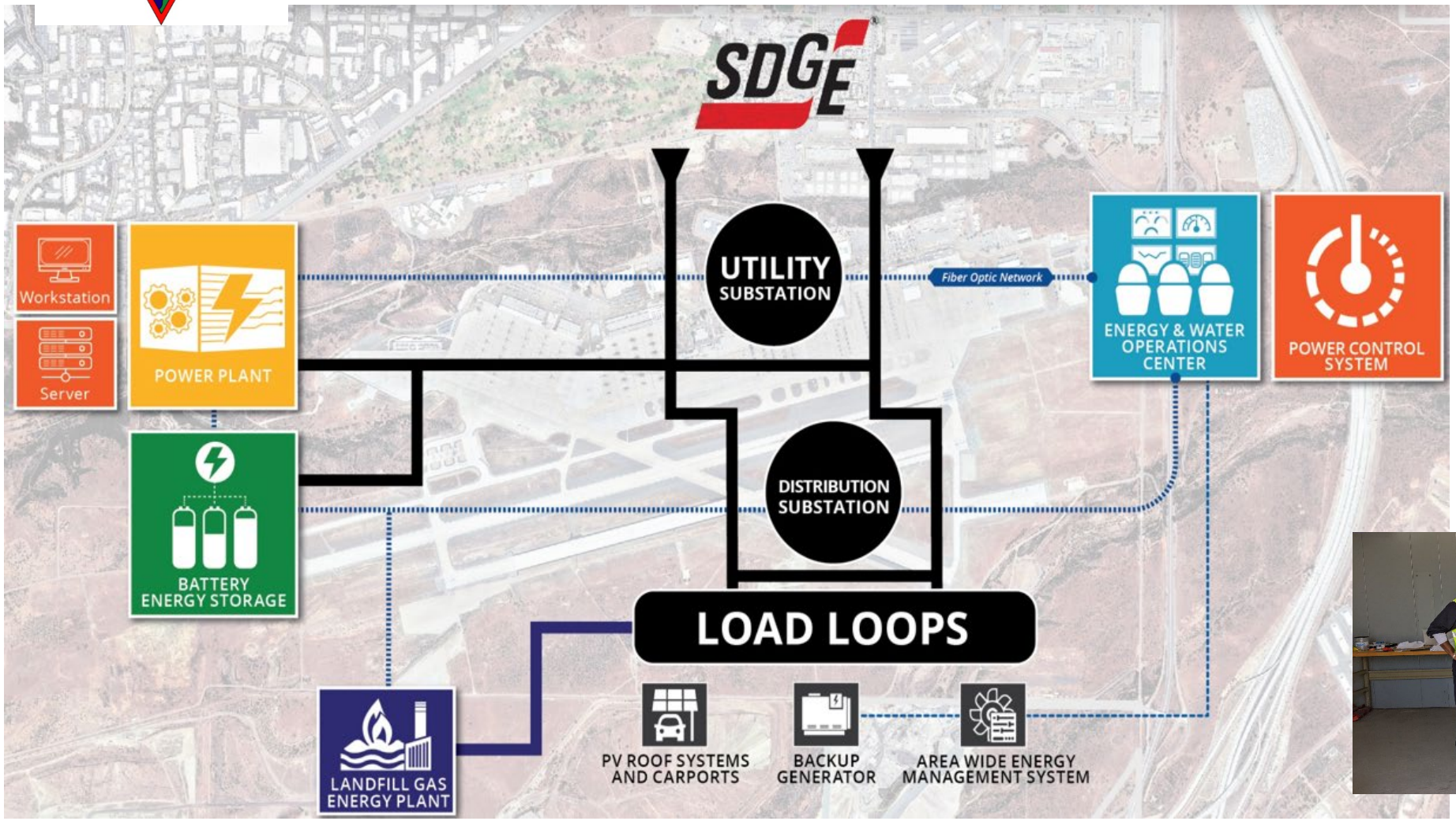
NREL National Renewable Energy Laboratory

MGL Microgrid Labs

PG&E

It takes a village to raise a Micro-Grid

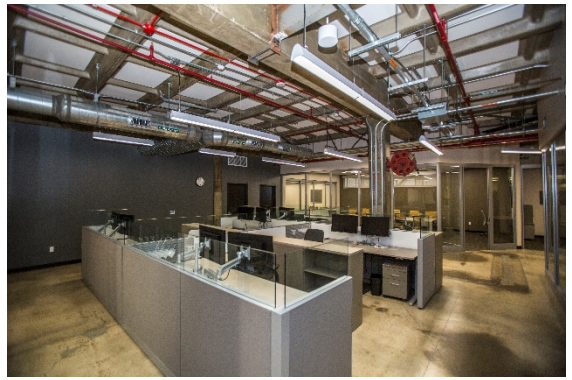
Microgrid Operations



Modes of Operation

- Normal (stand by)
- Economic
- Test Mode
- Island

Installation Microgrid Project Overview (P-906)



Project Details

- **FY2014 ECIP Project**
  - **Programmed Cost $18M**
  - **Awarded in May 2016 for $20M**
  - **Projected Completion 2020**
- **2018 California Energy Commission Grant**
  - **Awarded $5M to UCSD in 2018**
  - **Project Completion 2022**

Project Description

- Install diesel (4 MW) and natural gas (3 MW) generation with the ability to power 100% of the flight line and support facilities (100+ facilities = 4 – 6 MW, represented by the red island outline above)
- Incorporate existing onsite landfill power generation (3.2 MW) and existing PV generation (1.3 MW) into microgrid islanding as much as feasible.
- Build “Energy & Water Operations Center” at B6311
- Economic Mode creates costs savings through grid connected generation.
- Cyber Security accreditation through Risk Management Framework
- Grid Scale Energy Storage (CEC EPIC Grant)
- Base wide HVAC Demand Response (CEC EPIC Grant)

Project Goals

1) Energy Resilience (Fully Redundant Utility Power)
2) Maximize Onsite Energy Resource Integration
3) Cost Savings/Grid Support

Installation Microgrid Map

Thermal Energy Storage Plant

AWEMS HVAC Controller
(80 Buildings)
❖ DEMAND REPONSE (CEC Grant)

Microgrid Backup Power Plant

- 4MW Tier 4 Diesel Generator Set
- 3MW BACT Natural Gas Generator Set
- Central Microgrid Controller

❖ 2MW Li-ion Battery (CEC Grant)

Thin-Film PV Roof Systems

3.2 MW Landfill Gas Energy Plant

❖ 2MW Backup Generator w/ATS Paralleling Switch Gear

Critical Island Load

PV Carports

PV Carports

❖ Future