

GRID-S-CAPE

Microgrid Demonstration Project for the City of Fremont Fire Department Stations 6, 7 and 11



CEC PON-14-301
Demonstration of Low Carbon-Based Microgrids for Critical Facilities

Agenda

- Welcome/Introductions
- Microgrid System Introduction
- Project Introduction
- Site Locations
- California Energy Commission Requirements
- Project Timeline
- Project Design
- Facility Access Requirements
- Projected Energy Savings

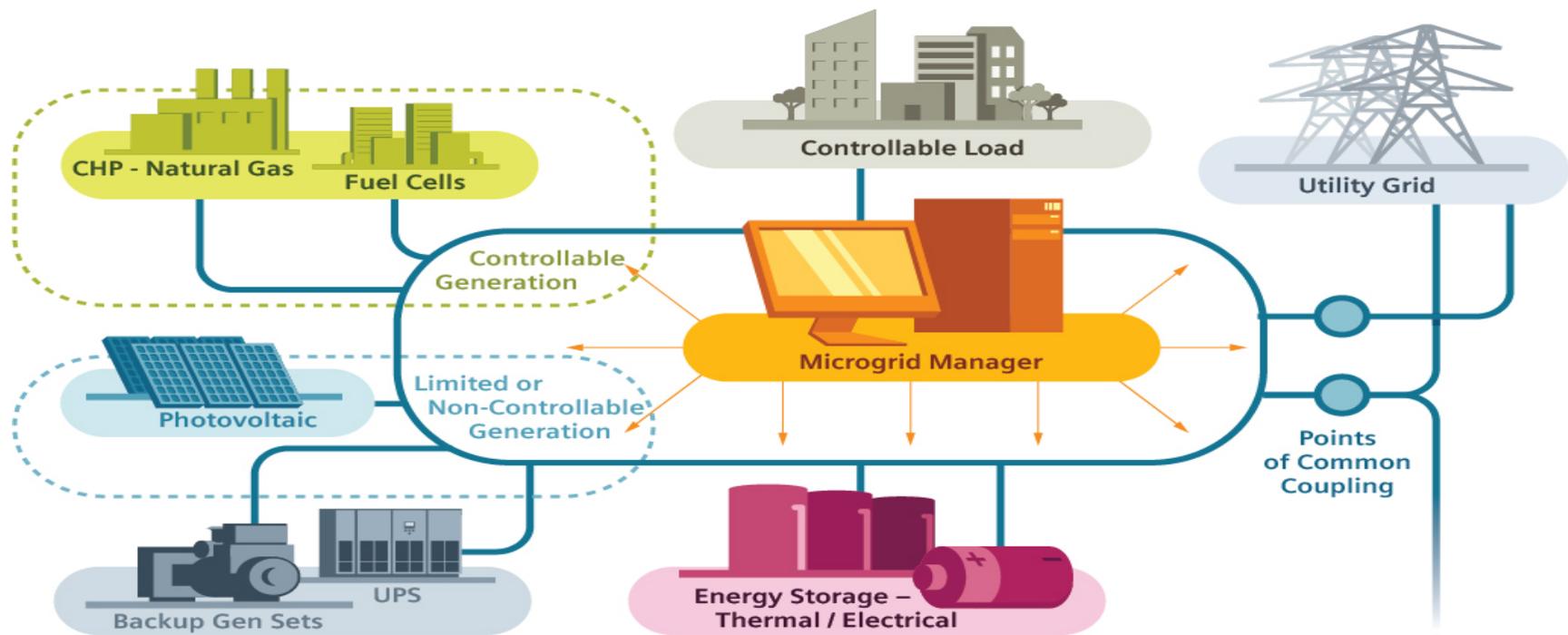
Mission Statement

Gridscape's focus is to enable sustainable transportation, provide grid intelligence, drive energy independence and promote industry standards globally.

Microgrid System Introduction

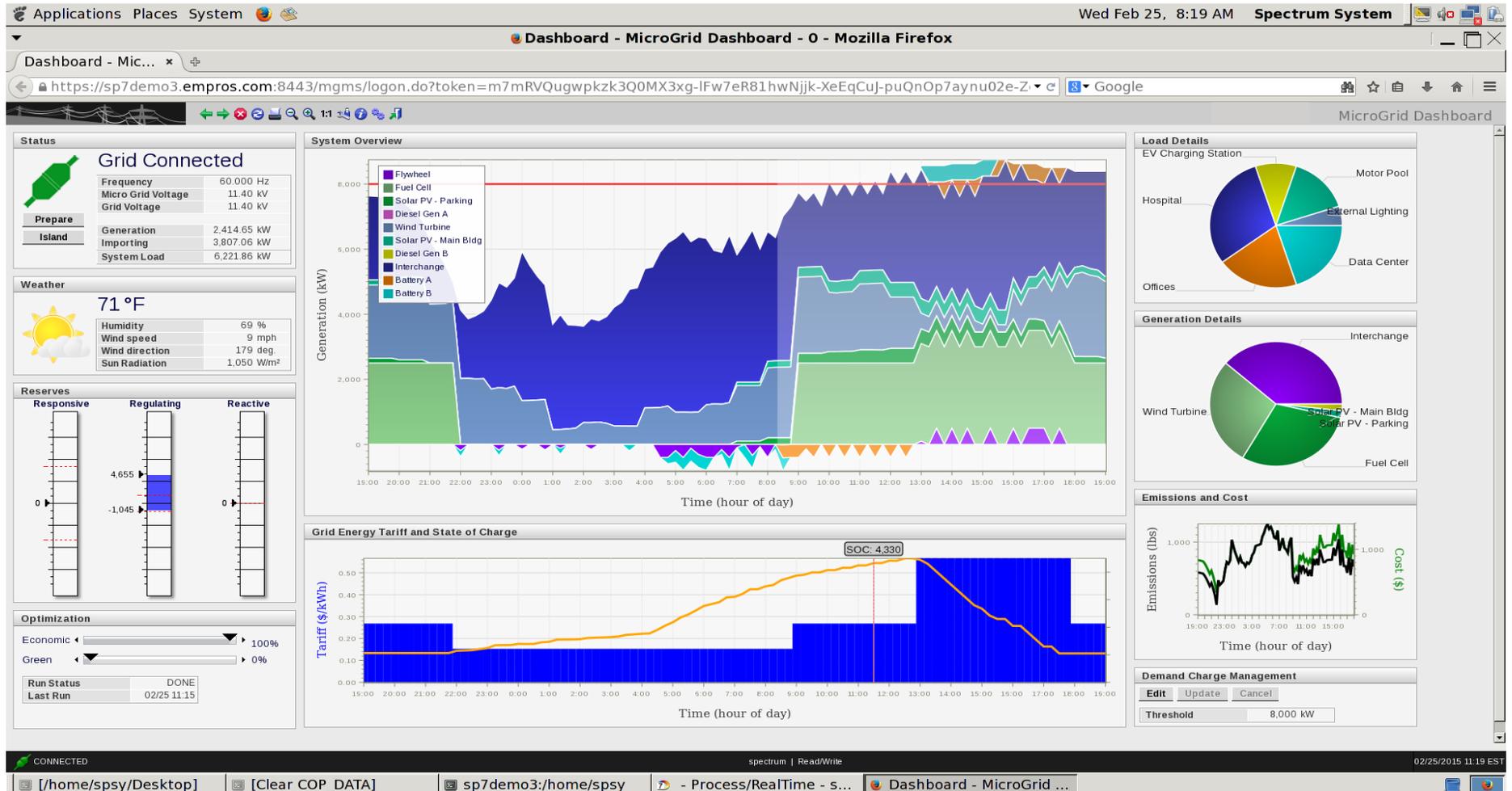
- Scaled down version of a power system
- Generate, distribute and regulate flow of electricity
- Grid connected or Islanded
- Integration with the utility grid
- Decentralized power generation
- Controllable loads

Microgrid System Introduction (cont.)



Microgrid System Introduction (cont.)

Dashboard – “Sample” Layout



Project Introduction/Goals

A two year Microgrid System Demonstration that:

- Protects critical facilities from service interruption
- Delivers Energy savings
- Integrates with renewable generation
- Reduces fossil fuel usage
- Efficiently manages resources with automation
- Provides technical and economic Microgrid performance data
- Identifies any barriers to commercial deployment

Site Locations

Based on 2014 PG&E Electric Bills

Site	Annual kWh Usage	Annual PG&E Bill
Fire Station #6	97,500 kWh	\$16,500
Fire Station #7	117,000 kWh	\$20,000
Fire Station #11*	64,000 kWh	\$12,000
COMBINED	278,500	\$48,500

**Fire Station 11 data reflective of site energy usage before it was officially opened in 2015.*

California Energy Commission Requirements

- Project must include Microgrid Controller/Energy Management System as per IEEE 2030.7
 - ✓ Identify, isolate and efficiently serve critical loads
 - ✓ Drop non-critical loads
 - ✓ Coordinate and control storage
 - ✓ Prevent export of power during over-generation
- Microgrid to serve critical facilities
- Automatically disconnect and operate independently from main grid
- Operate in islanded mode for a minimum of 3 hours
- Capable of being made commercially available
- Use smart inverters; IEEE 1547 or 1547.8 standards

Project Timeline

- Fire station #11:
Estimated to begin project by October 2015 and operational by January 2016. End 2 year demonstration by January 2018, depending upon:
 - Permitting
 - Installation
 - Commissioning
- Fire station #6 & #7 :
Estimated to begin both projects by February 2016 and operational by June 2016. End 2 year demonstration by June 2018.

Project Design

Equipment to be Installed:

Location	Solar	Energy Storage
Fire Station #11: 47200 Lakeview Blvd	22.3 kW parking canopy	Samsung Lithium-ion Battery (~80 kWhr)
Fire Station #6: 4355 Central Ave	37.1 KW parking canopy	Samsung Lithium-ion Battery (~80 kWhr)
Fire Station #7: 43600 S. Grimmer Ave	43.4 kW parking canopy	Samsung Lithium-ion Battery or IMERGY vanadium based flow battery (~80 kWhr)

Project Design (cont.)

Fire Station #6



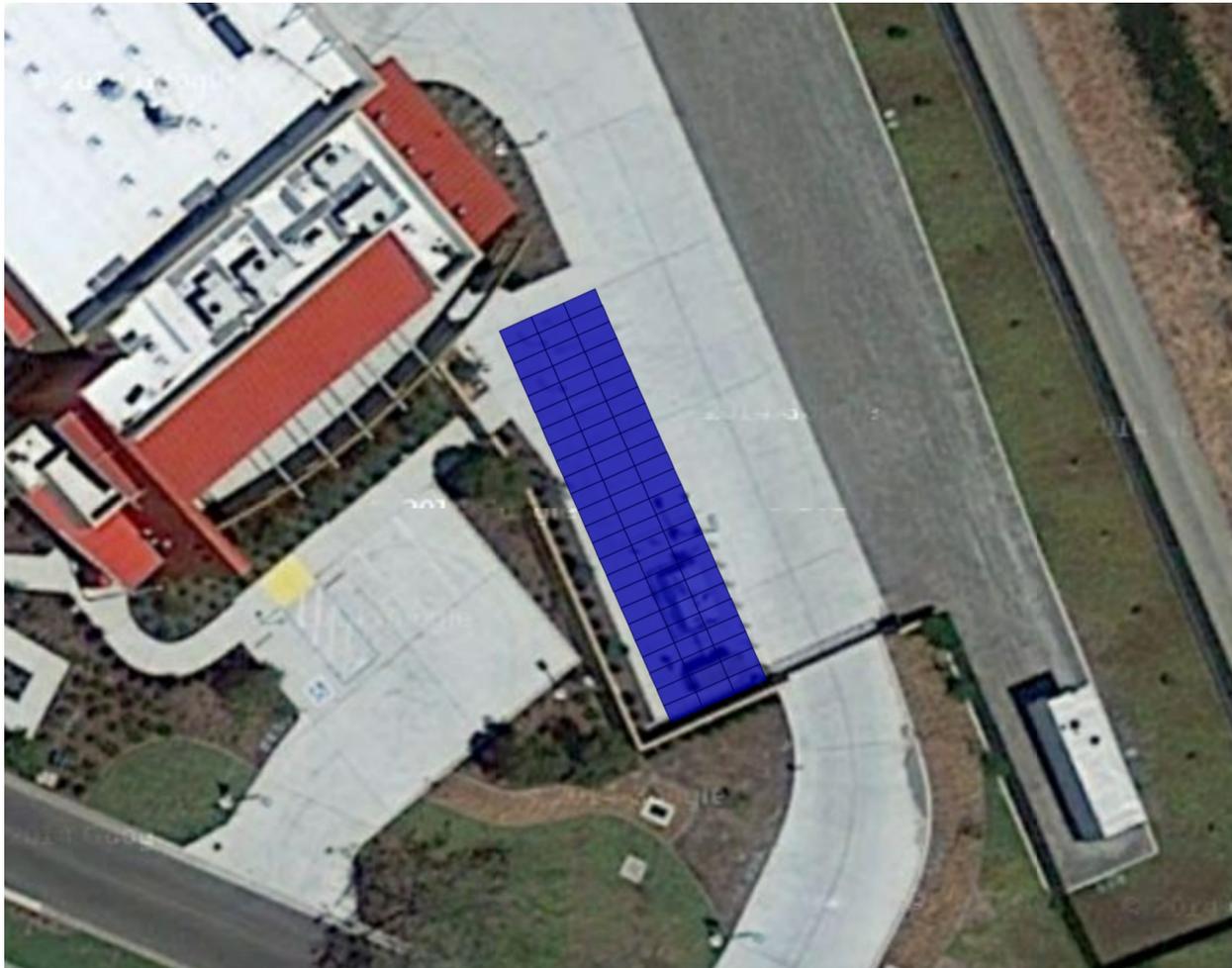
Project Design (cont.)

Fire Station #7



Project Design (cont.)

Fire Station #11



Project Design (cont.)



Facility Access Requirements

- Solar PV site survey for all 3 stations; parking lot, electrical service panel and PG&E meter location
- Inverter, battery equipment and enclosure measurement; PG&E meter location
- Solar PV, Battery and supporting equipment installation
- Computer and network equipment installation and testing
- Ongoing monthly inspection of equipment and occasional software upgrades over-the-air.

Projected Energy Savings: Energy Impact

Based on 2014 energy data

- Fire Station #6:

Average annual usage:	97,600 kWh
Annual Energy Produced by Solar:	52,310kWh
Annual Energy Offset:	56.6%

- Fire Station #7:

Average annual usage:	117,360 kWh
Annual Energy Produced by Solar:	66,995 kWh
Annual Energy Offset:	57.1%

- Fire Station #11:

Average annual usage:	64,131 kWh
Annual Energy Produced by Solar:	33,733 kWh
Annual Energy Offset:	52.6%

Thank You



Gary Calderon

VP Business Development

Phone: +1 408 889 3206

Email: gcalderon@grid-scape.com

www.grid-scape.com