

City of Fremont & Gridscape Solutions, LLC

CEC PON 14-301:
Demonstration of Low-Carbon based
Microgrid for Critical Facilities



Introduction

- Demonstration of “Microgrid Systems” on Fire Stations
- Solar PV System + Battery + Smart Controller
- Systems operate with or independently from the grid
- Provides clean energy generation *plus* operational resiliency



Project Overview

- Project Costs

\$1,817,925 Grant from the CA Energy Commission (PON-14-301: Group 1)

+ \$657,260 in matched funds

= \$2,475,185 total project value

- Proposed Sites

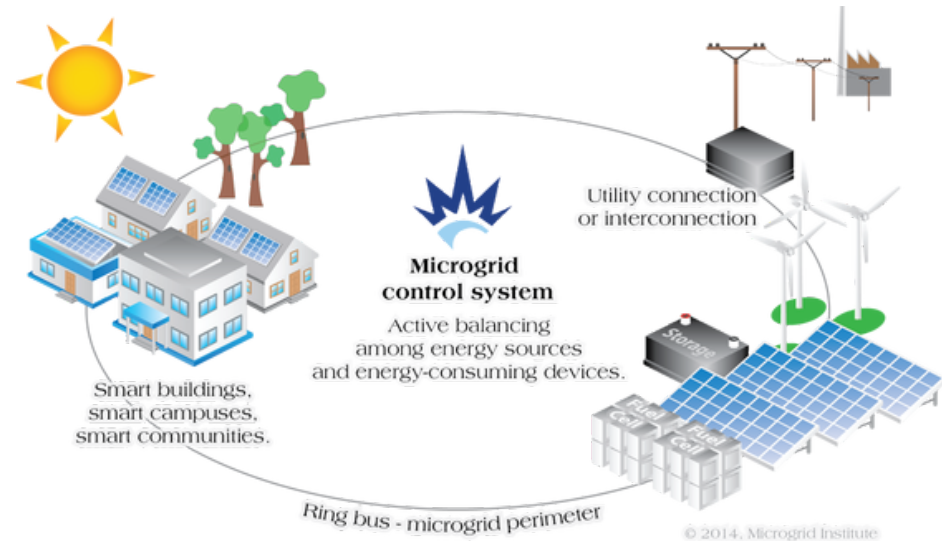
- (3) Fremont Fire Stations

- Benefits to Sites

- Resilience
- Energy Cost Savings
- Clean Energy Source

- Project Details (per site)

- 37-43 kW Solar Canopy + 95 kWhr Energy Storage
- Gridscape Microgrid Controller System
- Gridscape Cloud-based Predictive Energy Management Software



Site Locations

Fire Station #6

4355 Central Ave., Fremont, CA 94536

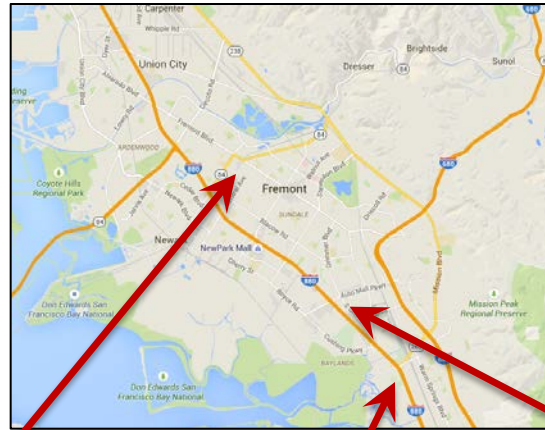
- 13,224 sq. ft.
- 97,500 kWh/yr
- \$17,900/yr electric bill (~18.3¢/kWh)



Fire Station #7

43600 S. Grimmer Blvd., Fremont, CA 94538

- 10,161 sq. ft.
- 108,000 kWh/yr
- \$19,000/yr elec. bill (~17.6¢/kWh)



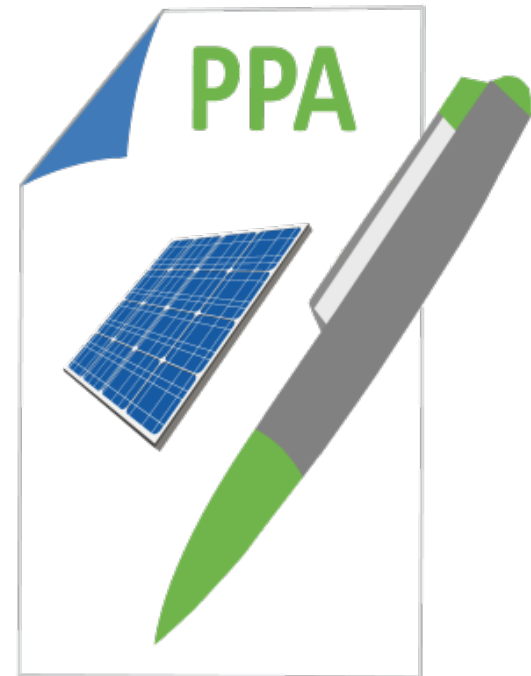
Fire Station #11 (LEED Gold)

47200 Lakeview Blvd., Fremont, CA 94538

- 10,375 sq. ft.
- 64,500 kWh/yr
- \$12,500/yr elec. bill (~19.4¢/kWh)

City Contracting & Approval

- CA Government Code 4217.10-4217.18:
 - Public facilities can sole source for energy services contracts
- “Demonstration Period”
 - System design, Construction, and Testing per CEC grant requirements
 - City provides Gridscape access to sites; receives energy produced at no cost
- “Regular Term”
 - 10 yr PPA w/ system monitoring & maintenance
 - Electricity pricing at ½ cost of PG&E



PHASE 1: 2016 to 2018

Grant-Funded Demonstration Period

- \$1.8M from CEC to Gridscape to Demonstrate Low-Carbon Based Microgrid for Critical Facilities
 - Gridscape designs, constructs, tests, & reports on system performance to CEC
 - City provides Gridscape access to sites & receives energy at no cost



PHASE 2: 2018 to 2028

Power-Purchase Agreement (PPA)

- City contracts with Gridscape to buy power generated by the systems for a 10 year period
 - Gridscape owns systems & provides all monitoring, maintenance, & warranties
 - City purchases energy for 1/2 of current PG&E rate

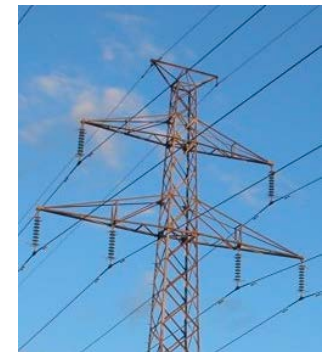
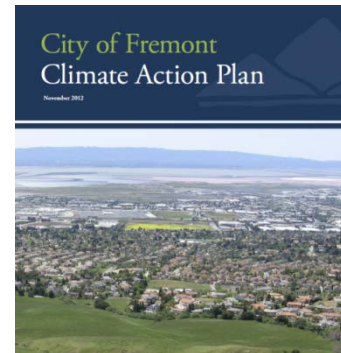
	Current PG&E Rate	PPA Electric Rate	Annual Rate Escalator
Fire Station #6	18.3 ¢/kWh	9.16 ¢/kWh	2.5%
Fire Station #7	17.61 ¢/kWh	8.81 ¢/kWh	2.5%
Fire Station #11	19.42 ¢/kWh	9.71 ¢/kWh	2.5%

Utility Bill Savings

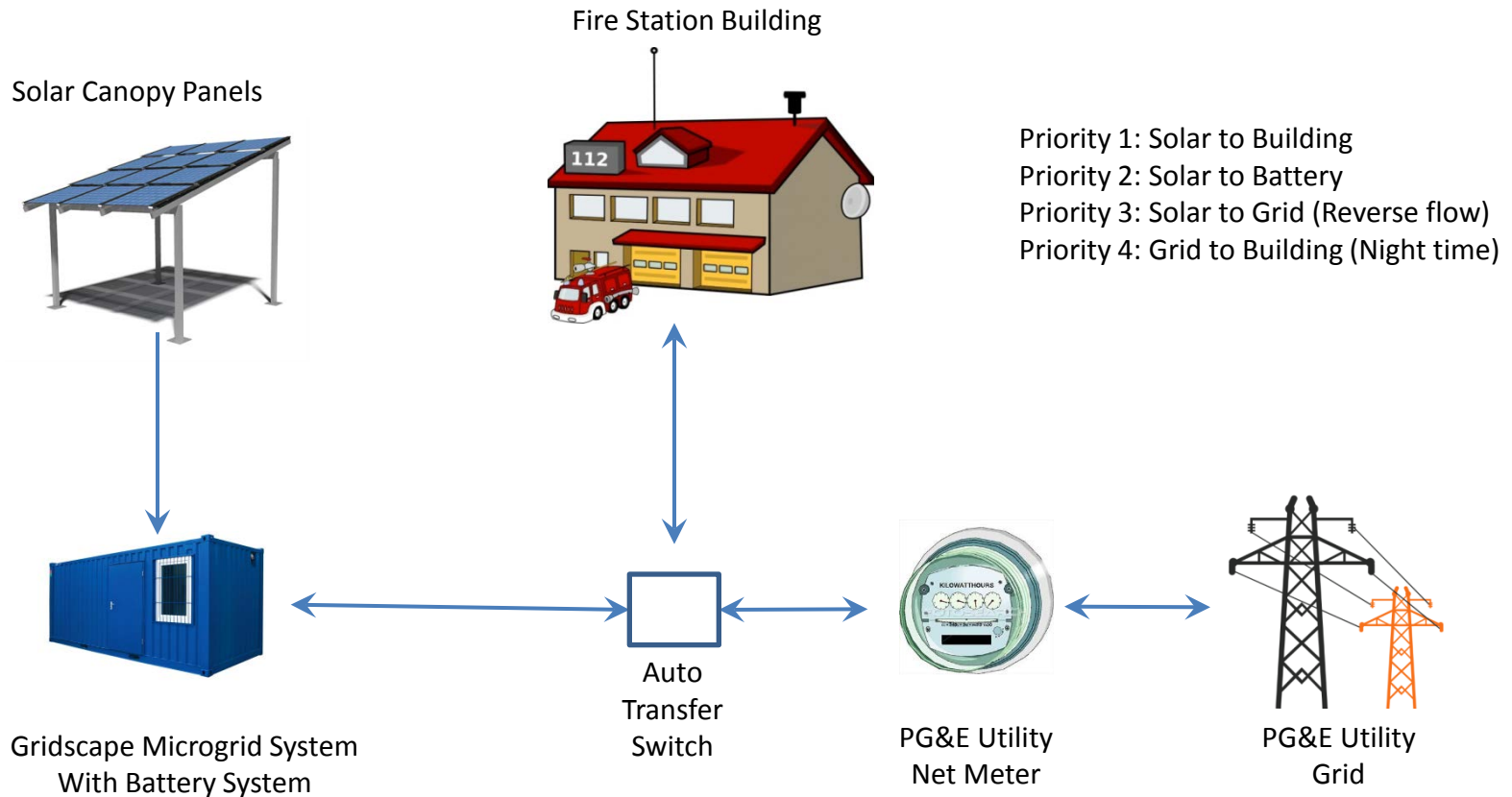
	Station #6	Station #7	Station #11	COMBINED
PG&E Bill Savings during Demonstration Period	\$9,574	\$11,604	\$10,849	\$32,027
Electric Bill Savings Over 10 Year PPA Term	\$60,886	\$74,399	\$79,559	\$214,844
Total Electric Bill Savings (Demonstration + PPA)	\$70,460	\$86,003	\$90,408	\$246,870

Benefits to City

- ✓ Protects critical facilities against power outages
- ✓ Reduces demand on the grid through use of stored battery energy
- ✓ Increases community resiliency
- ✓ Reduces utility bills by \$32,000 during Demonstration Period + \$215,000 over 10 year PPA Term
- ✓ Reduces municipal greenhouse gas emission reductions by ~80,000 lbs/yr (~36 MTCO₂e)
- ✓ Supports local cleantech company advancement & innovation

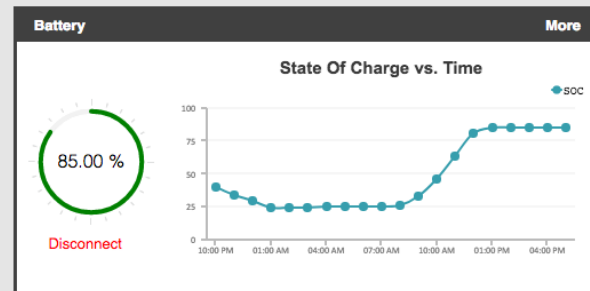
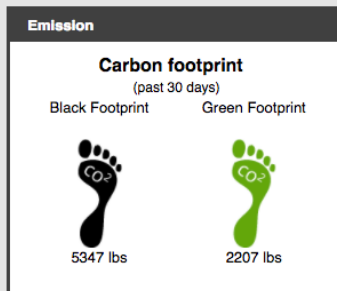
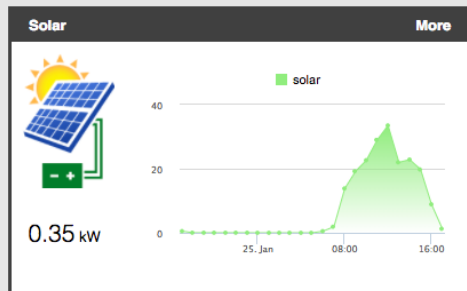
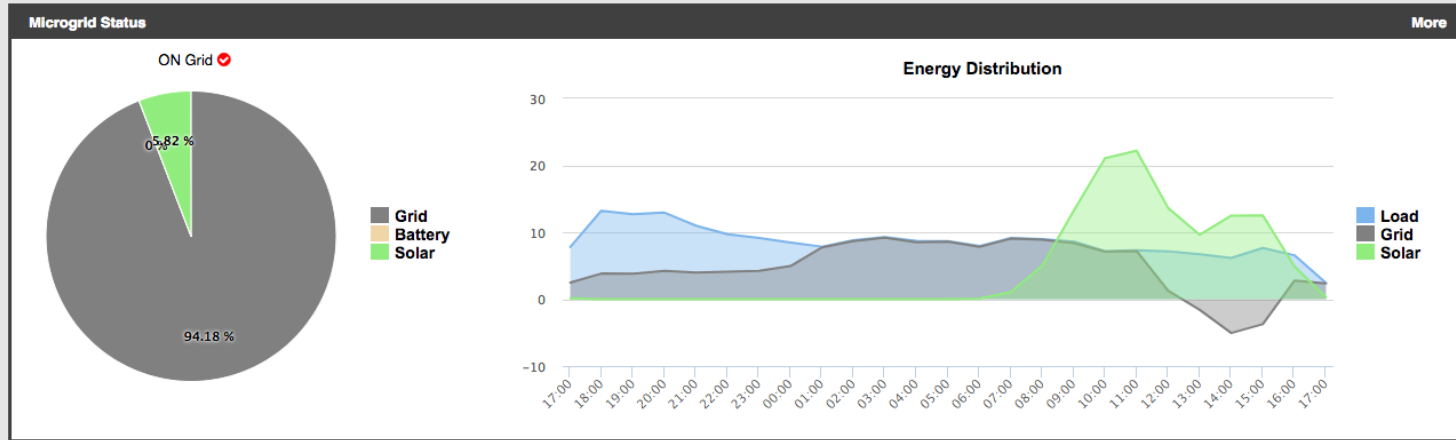
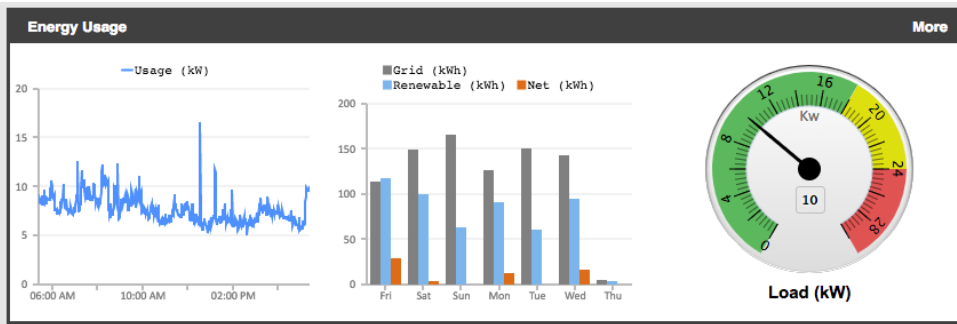


System Design & Power Flow



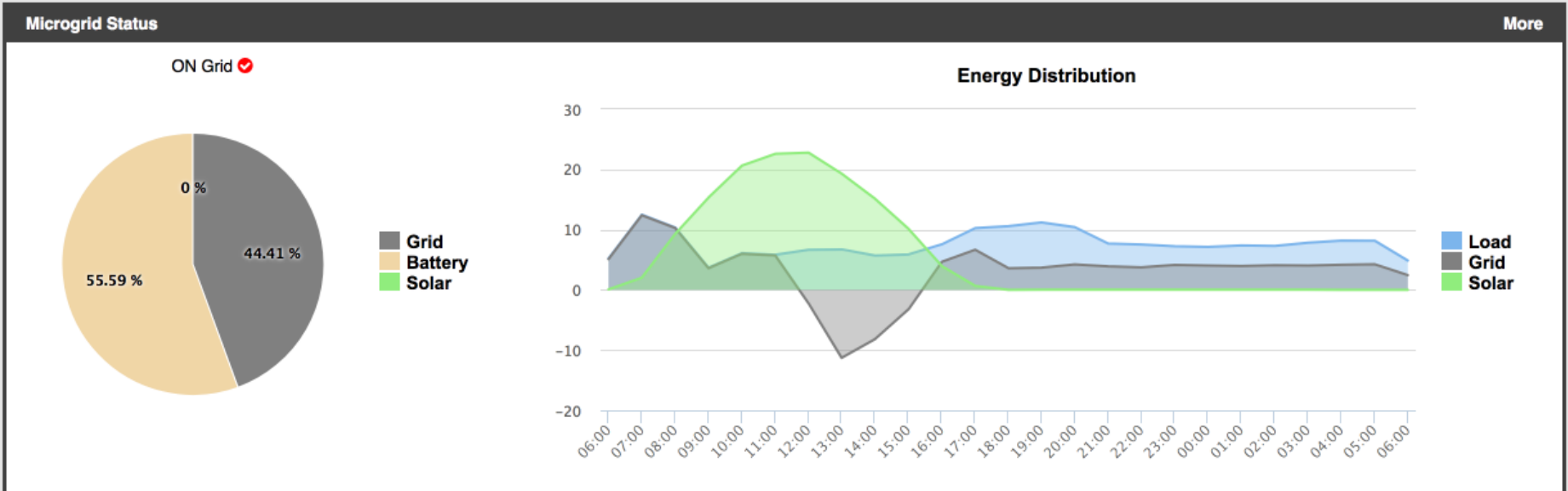
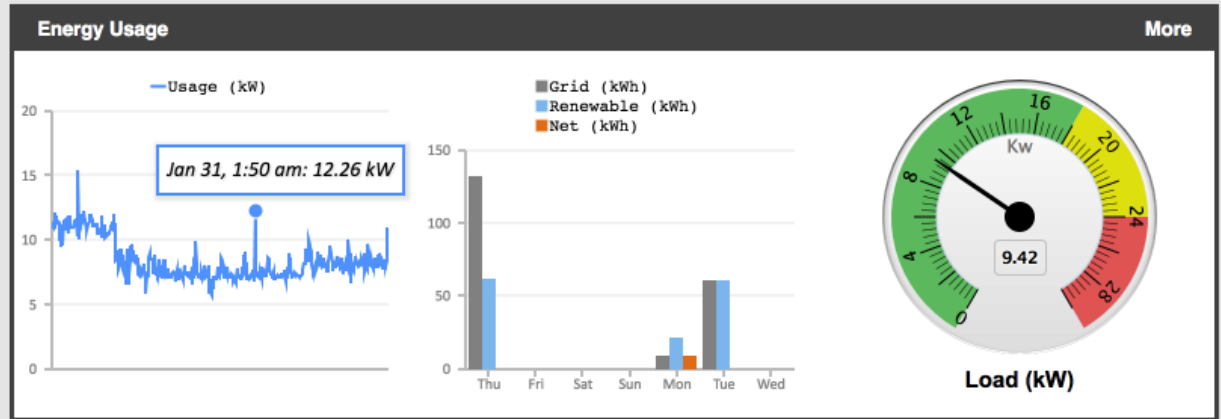
Gridscape eScope Dashboard

December 25, 2017



Gridscape eScope Dashboard

January 31, 2018



An aerial photograph of Fremont Fire Station 11. The main building is a large, light-colored structure with a flat roof. A smaller, single-story building with a red roof is attached to the side. The text "FREMONT FIRE STATION 11" is visible on the side of the main building. To the right, a long, low structure has a roof covered in solar panels. Several vehicles are parked in the lot. The surrounding area is dry and grassy, with a road and trees in the background.

Thank You!

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