Clean Coalition

Making Clean Local Energy Accessible Now

Goleta Load Pocket and Montecito Community Microgrid Initiatives

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Clean Coalition (non-profit) Mission

To accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise

Community Microgrid Vision

Community Microgrids (CM): The grid of the future

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A Community Microgrid is a new approach for designing and operating the electric grid, stacked with local renewables and staged for resilience.

Key features:

- A targeted and coordinated local grid area served by one or more distribution substations
- High penetrations of local renewables and other Distributed Energy Resources (DER) such as energy storage and demand response
- Staged capability for ongoing renewables-driven power backup for critical and prioritized loads across the grid area
- A solution that can be readily extended throughout a utility service territory – and replicated into any utility service territory around the world

Goleta Load Pocket (GLP)

The GLP is the perfect opportunity for a comprehensive Community Microgrid

The GLP stretches from northwest of Gaviota to southeast of Carpinteria

GLPCM collaborators

Clean Coalition

Community Environmental Council

CAUSE
Central Coast Alliance United for A Sustainable Economy

Clean Coalition

World Business Academy

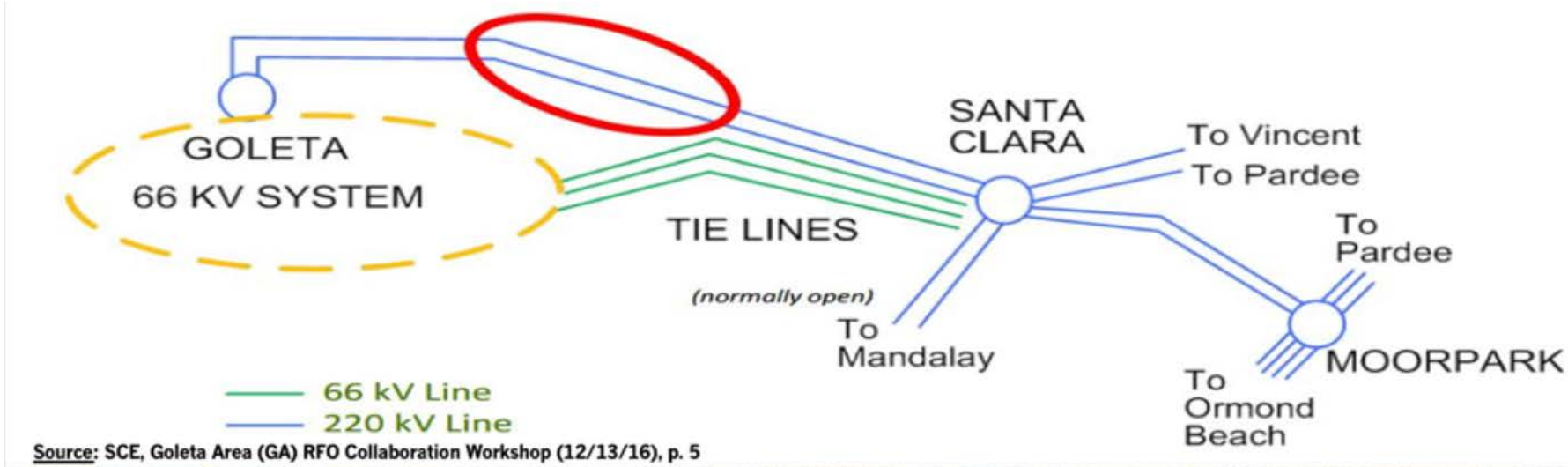
LACI

Sierra Club

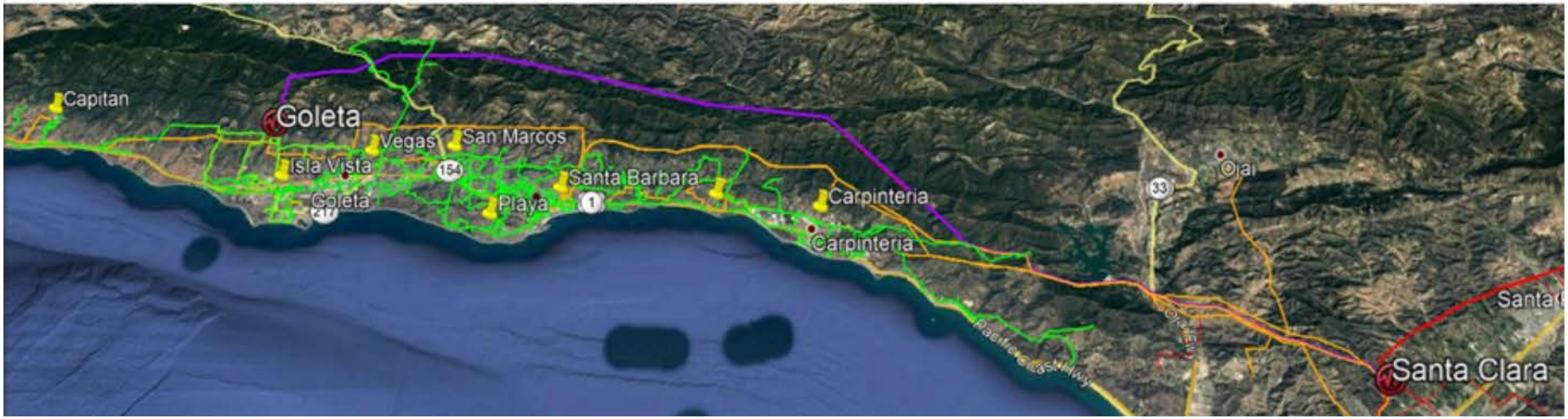
GLP Community Microgrid "APE"

- **Aim:**
  - Realize a comprehensive Community Microgrid for the entire Goleta Substation grid area.
  - Ensure that the GLP resilience objective is delivered via local renewables and other DER, and preempt any new gas peaker infrastructure.
  - Deliver the trifecta of Community Microgrid benefits to the region in the form of economic, environmental, and resilience benefits.
- **Plan:**
  - Assess the level of resilience that can cost-effectively be provided by the GLP Community Microgrid (GLPCM).
  - Create a multi-dimensional narrative of gas peakers as neither clean, safe, nor resilient.
  - **Showcase the Community Microgrid approach via Montecito Community Microgrids.**
  - Facilitate policies and programs that can realize a cost-effective GLPCM.
    - Feed-In Tariff (FIT), streamlined interconnection, residential solar+storage programs, etc.
  - Gain community support for the GLPCM approach from electeds to the public.
  - Prepare to win the CPUC battle that will be fought starting in early-2019.
- **Execution:**
  - Assign responsible parties for each planned task.
  - Identify a GLPCM Initiative manager.
  - Secure funding for a successful initiative.

GLP is vulnerable to transmission system disruption



Source: SCE, Goleta Area (GA) RFO Collaboration Workshop (12/13/16), p. 5



May 2016 Edison Fire
(NW of Santa Clara station- multiple lines threatened)

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December 2017-Thomas Fire
(Multiple Outages)

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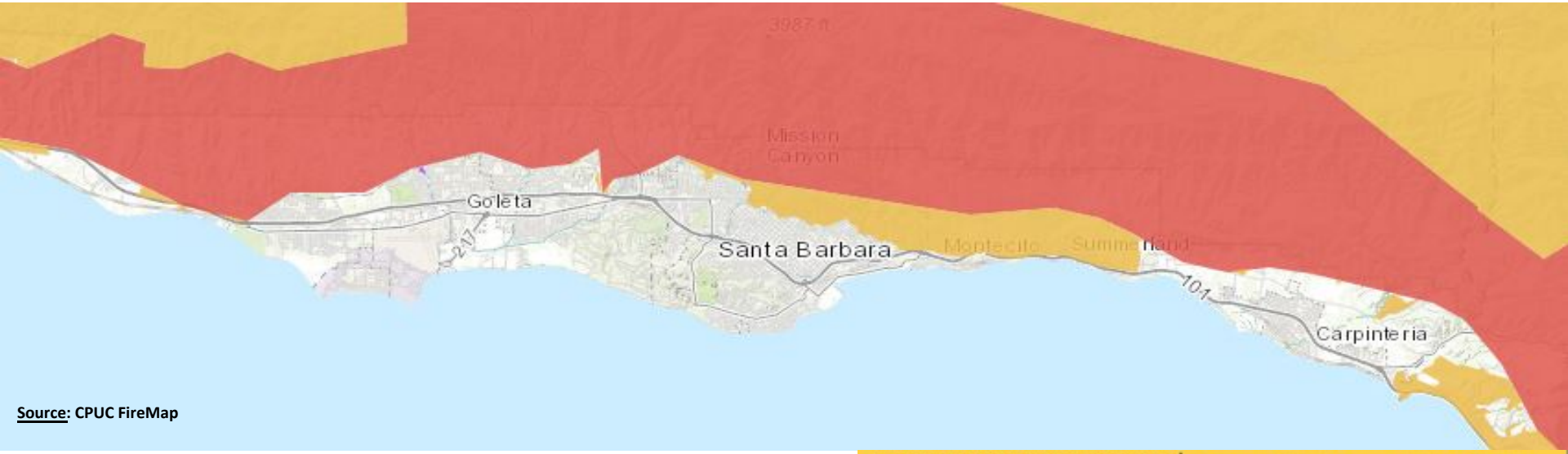
Transmission lines subject to preemptive shutdown



Given the recent passage of wildfire legislation and potential liability for wildfires started from utility wires and equipment, SCE has instituted preemptive measures, outlined on the right, that may result in more frequent de-energizing of transmission lines in advance of oncoming wildfires.

The CPUC FireMap above shows that the Goleta Load Pocket is surrounded by extreme (Tier 3) fire threats.

SCE is positioning to propose a gas plant in GLP

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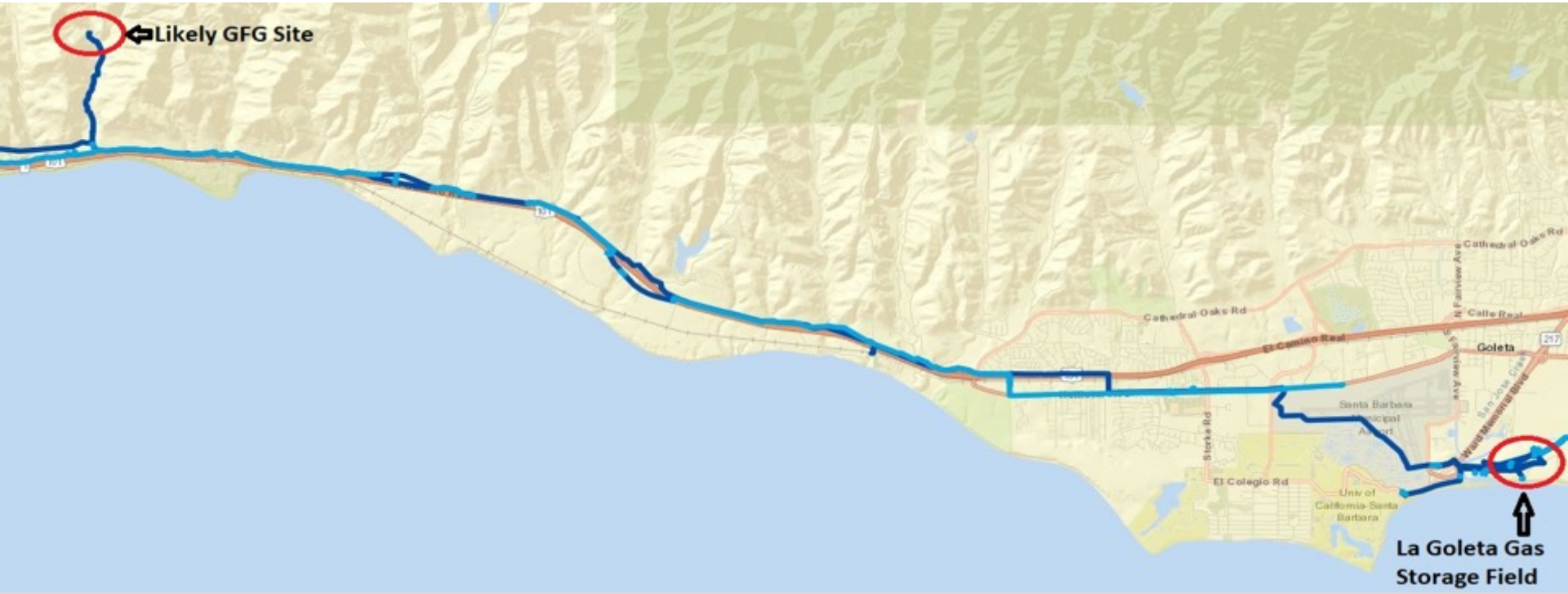
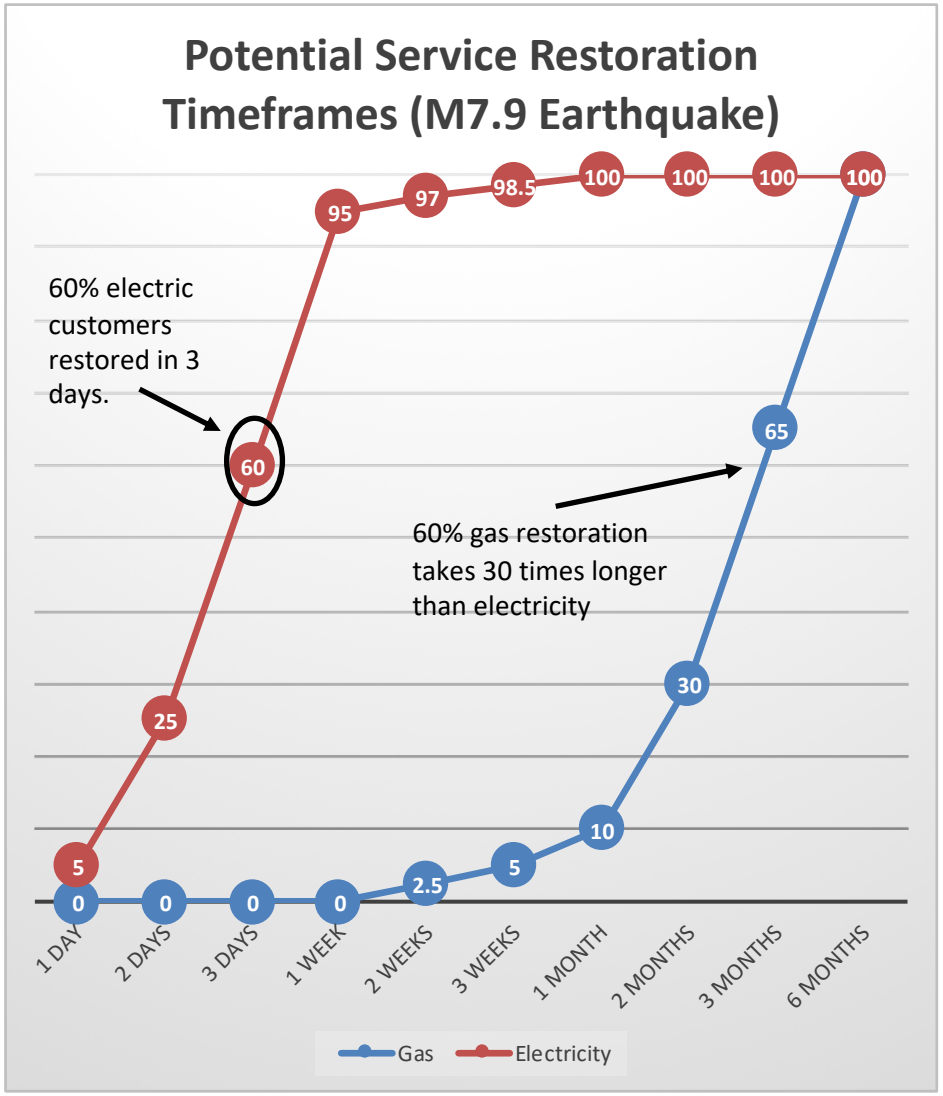
- **SCE Statement:** “Most project offers that can address resiliency are natural-gas based.”
- **Likely Remote Location:** Adjacent to the Capitan Substation, which is ~15 miles northwest of the La Goleta gas storage field.



Natural gas infrastructure is not resilient

- **Assertion:** SCE will frame gas-fired generation (GFG) as resilient.
- **Reality:** Gas infrastructure is not resilient and requires 30 times longer to restore service than electricity.
- **Threats:** Gas infrastructure is vulnerable to earthquakes, fires, and mudslides, as well as terrorism.

2010 San Bruno Pipeline Explosion



Source: The City and County of San Francisco Lifelines Study

Recent gas pipeline explosions

- October 9, 2018: British Columbia.
- September 13, 2018: Merrimack Valley, Massachusetts. Over 80 individual fires, one person killed and 30,000 forced to evacuate.
- February 17, 2017: A natural gas pipeline operated by Kinder Morgan in Refugio Texas exploded creating a massive fire. The explosion shook homes 60 miles away.
- February 10, 2017: A natural gas pipeline operated by Phillips 66 Pipeline in St. Charles Parish, LA exploded, injuring 3 workers.
- February 1, 2017: A DCP pipeline in Panola County TX exploded and created a crater in an airport runway, shutting down the airport for a month.
- January 17, 2017: A natural gas pipeline operated by DCP Midstream exploded in Spearman, TX, which led to multiple fire crews being called to the scene.
- From 2010 to 2016 -- Gas companies reported 35 explosions and 32 ignitions at their transmission pipelines, according to federal records. The explosion killed 17 people and injured 86.
- September 9, 2010: San Bruno, California, killed eight and injured 51 people.

La Goleta Gas Storage Field

- Converted into a gas storage reservoir in 1941, it is the oldest storage facility of four maintained by SoCalGas and is the third largest, with a maximum capacity of 21.5 billion cubic feet.
- The gas field is within an anticlinal structure cut and bounded on the north by the More Ranch Fault.

The GLPCM requires multi-faceted action

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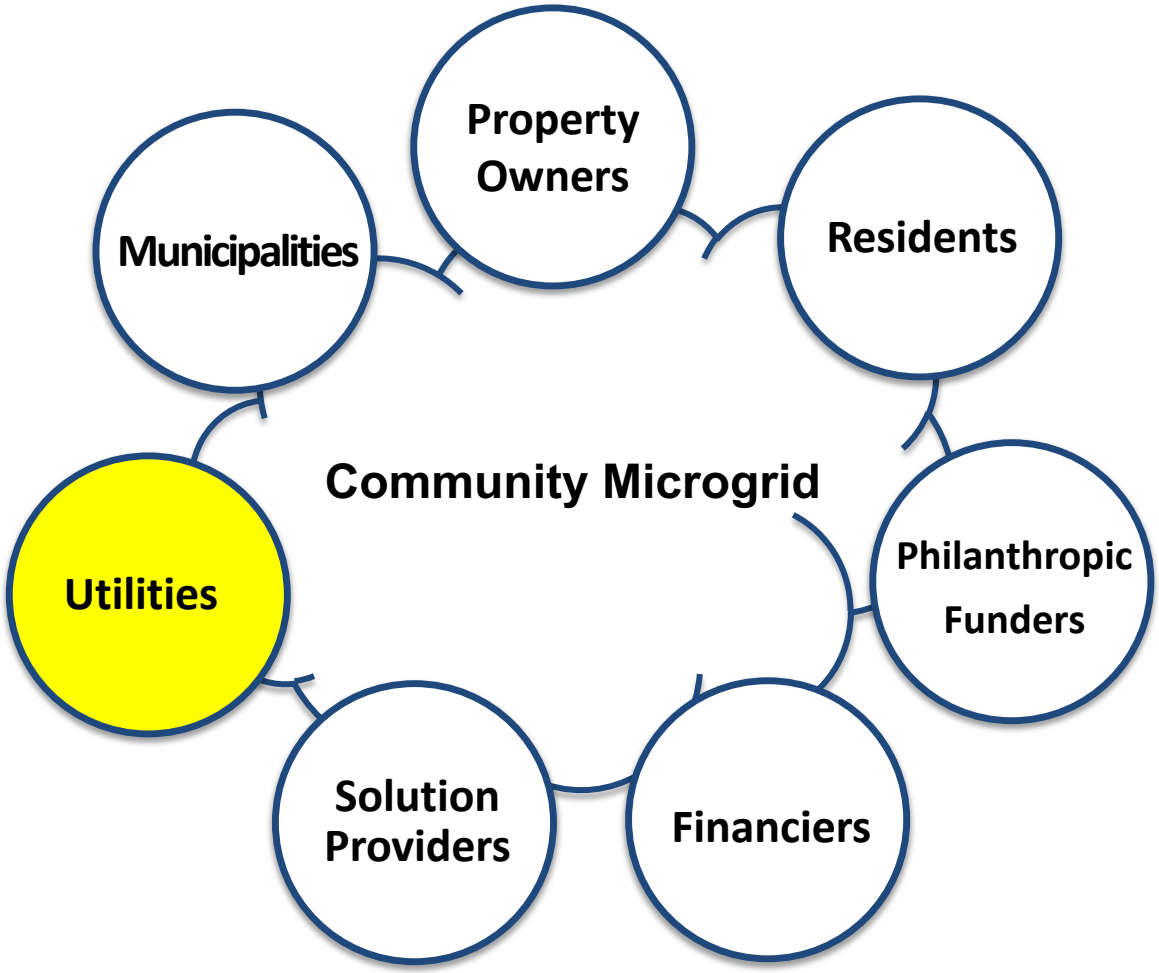
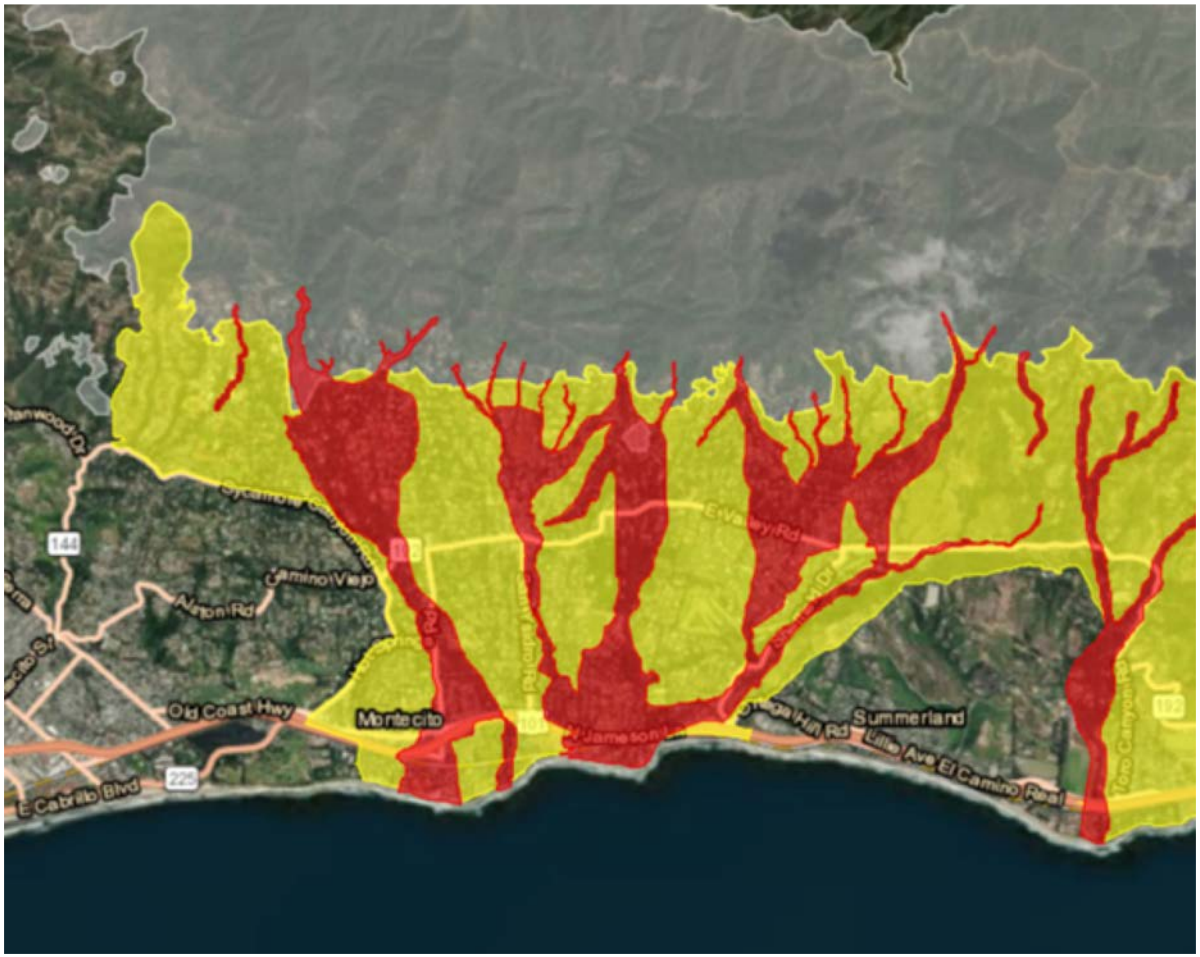
- Amend Santa Barbara County Land Use and Development Code (LUDC) to remove de facto ban on installing In-Front-of-Meter (IFOM) solar.
- Santa Barbara, Goleta, and Carpinteria cities to take leadership role in securing sufficient solar siting potential.
- Local government review of Laws, Ordinances, Regulations, and Standards (LORS) in conflict with GFG plant.
- Amend and/or enact local LORS to impose local regulations/ban on natural gas power facilities.
- Persuade SCE to procure local renewables and other DER through a market-efficient FIT and to allow distribution grid to provide Community Microgrid functionality during transmission grid outages.

Community Microgrid key stakeholders



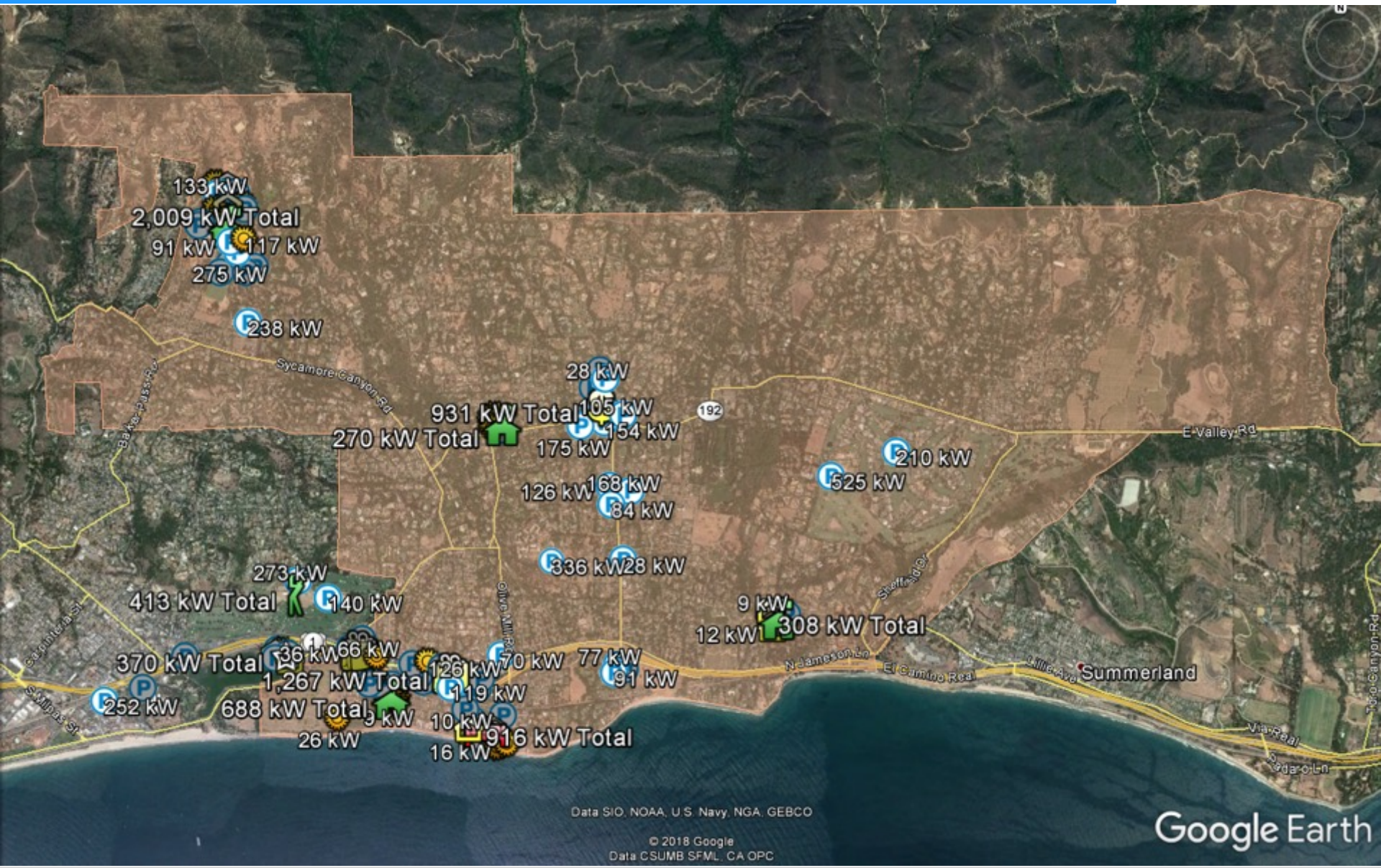
Montecito offers opportunity for initial demonstration



Map of areas at high and extreme risk from mud and debris flow in the event of a major storm.

Source: Santa Barbara County OEM

Solar Siting Survey (SSS) for Montecito



Hot Springs Feeder via Santa Barbara Substation

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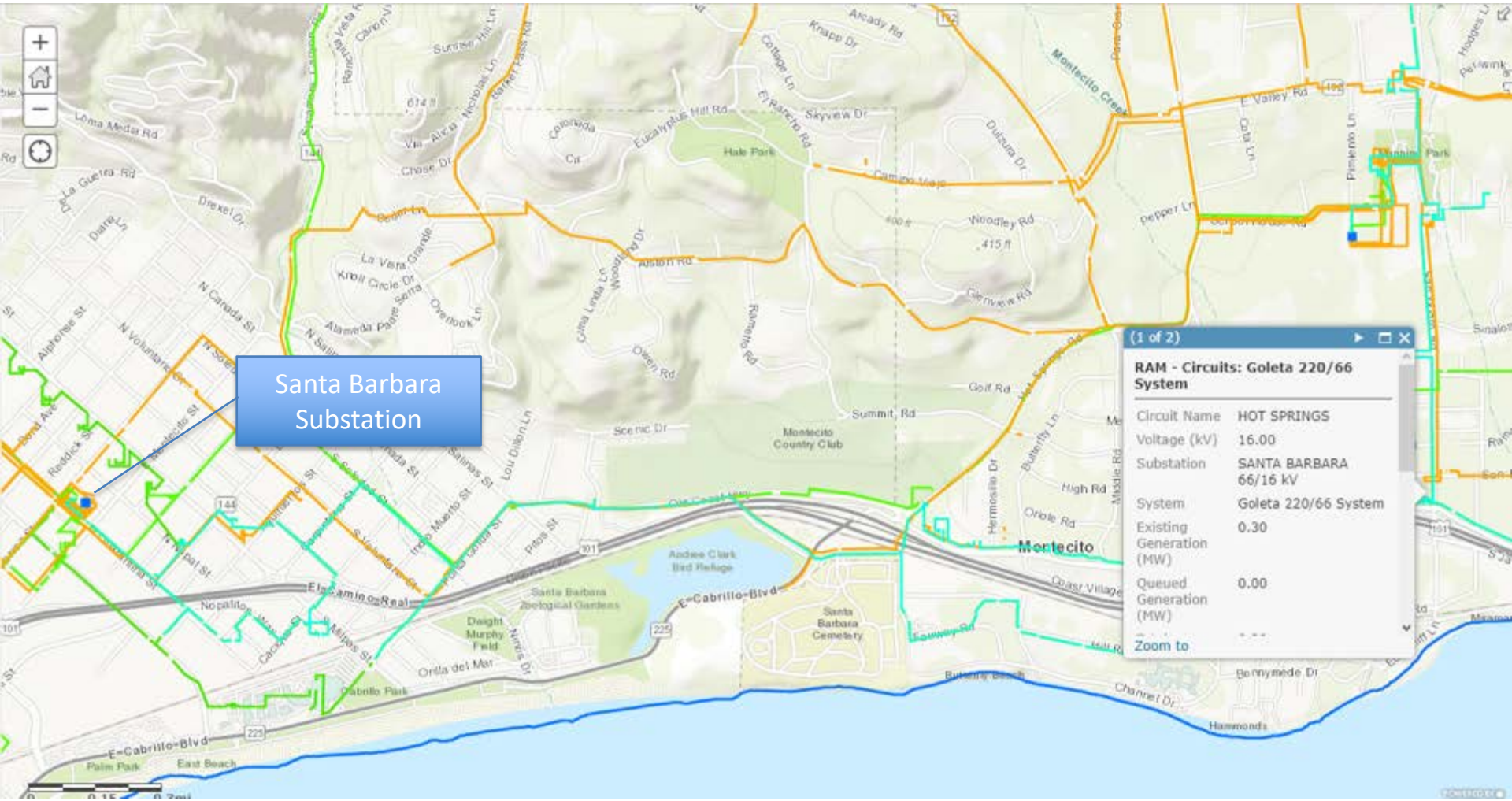

Upper Village Community Microgrid block diagram

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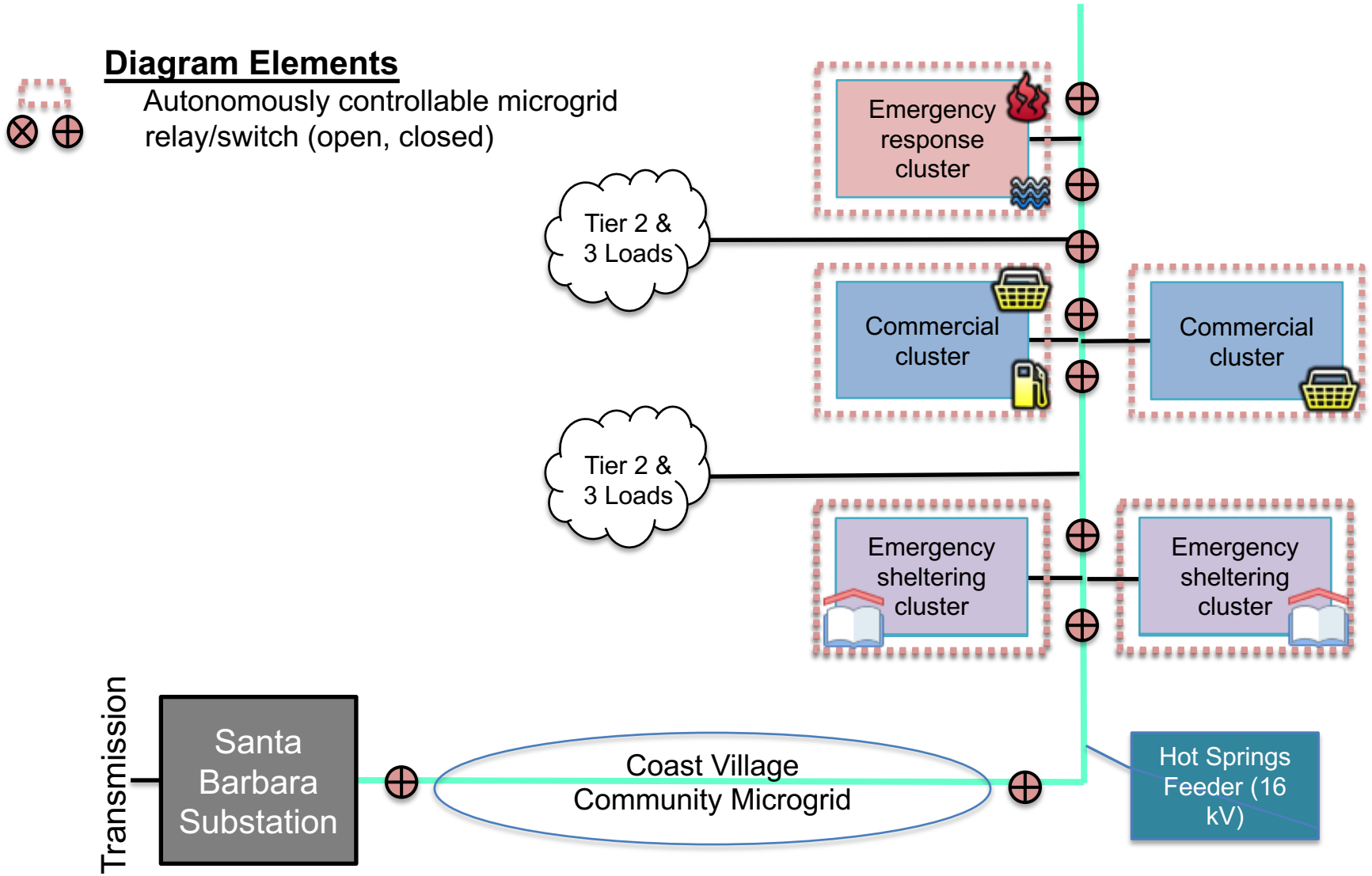

Upper Village critical facilities include five along Hot Springs Feeder

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Upper Village emergency response facilities

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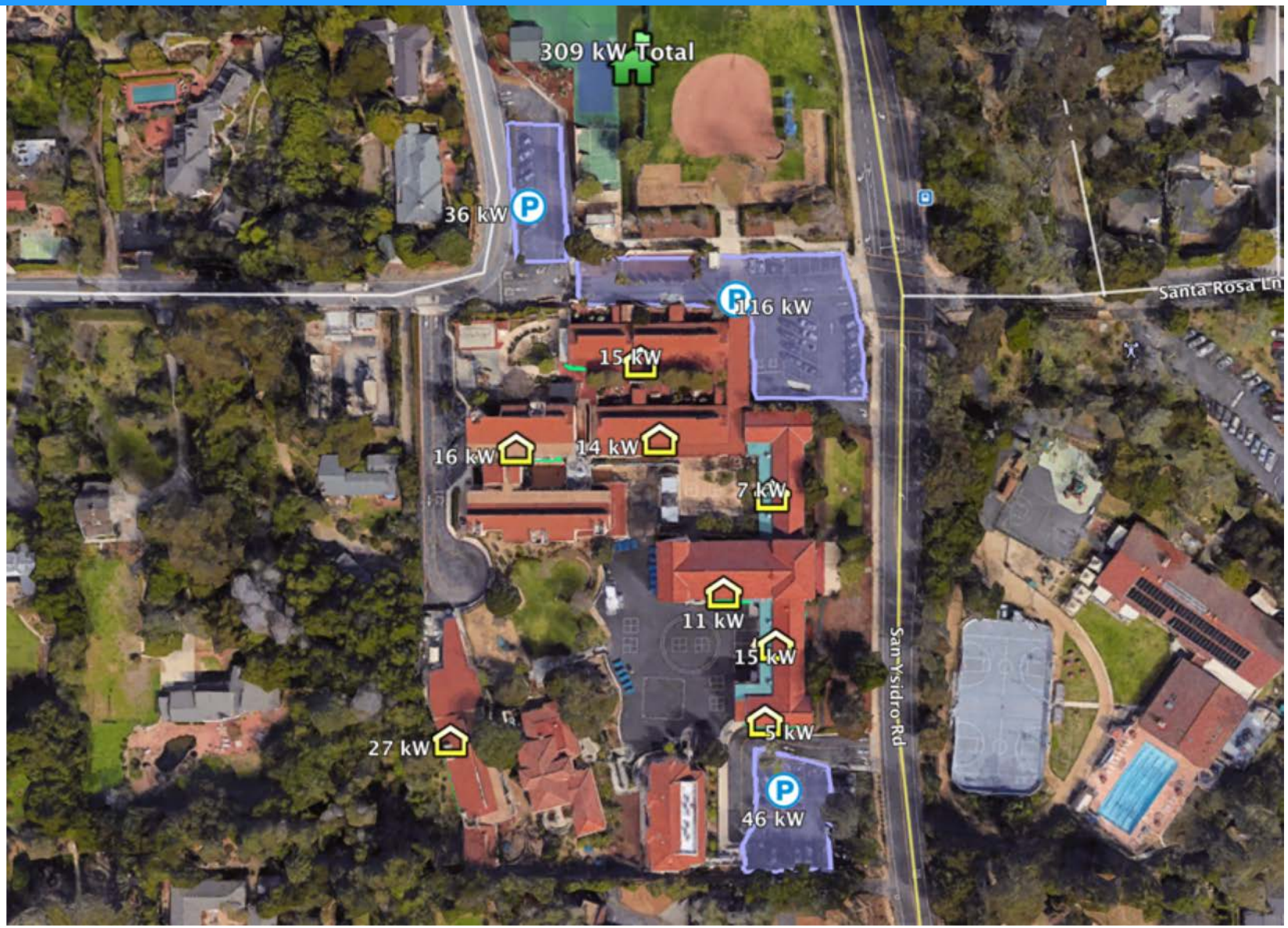
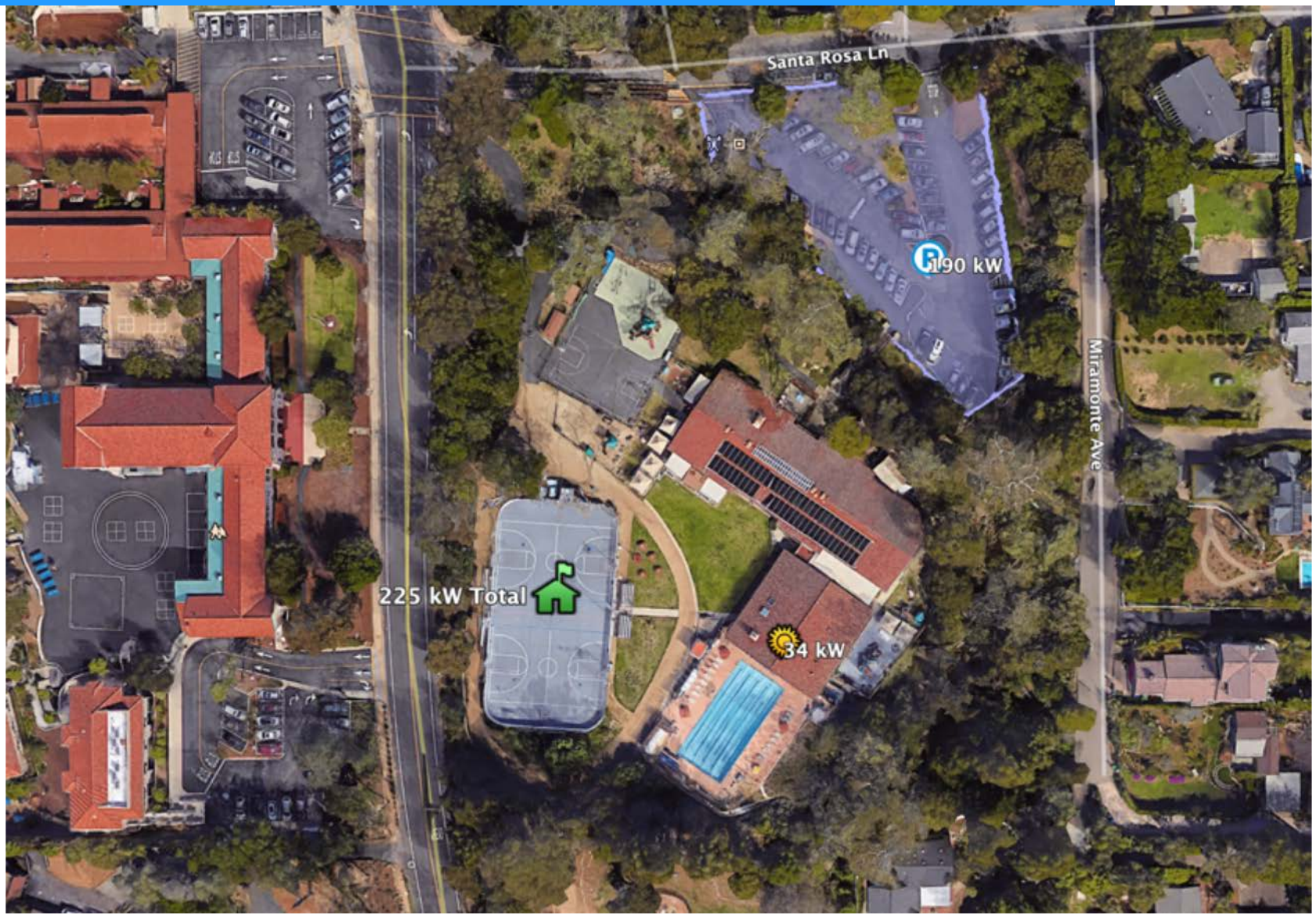
Site	Annual Historic Use	Proposed Solar PV Capacity (DC)	Solar PV Annual Production
Fire District	103,623 kWh	70 kW	102,533 kWh
Pump House	21,415 kWh	14.5 kW	21,379 kWh
WD Office	28,716 kWh	19.5 kW	28,765 kWh
WD Mech Yard	14,933 kWh	10.2 kW	15,141 kWh
Sand Lot	NA	75.9 kW	112,069 kWh
Phase 1 Total	168,687 kWh	190.1 kW	279,887 kWh

Note that the 75.9 kW Solar PV system proposed for the Sand Lot would be used to offset electricity from other municipal electric accounts, such as the Water District accounts not located in this site, via the Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) program.

Montecito Union School District



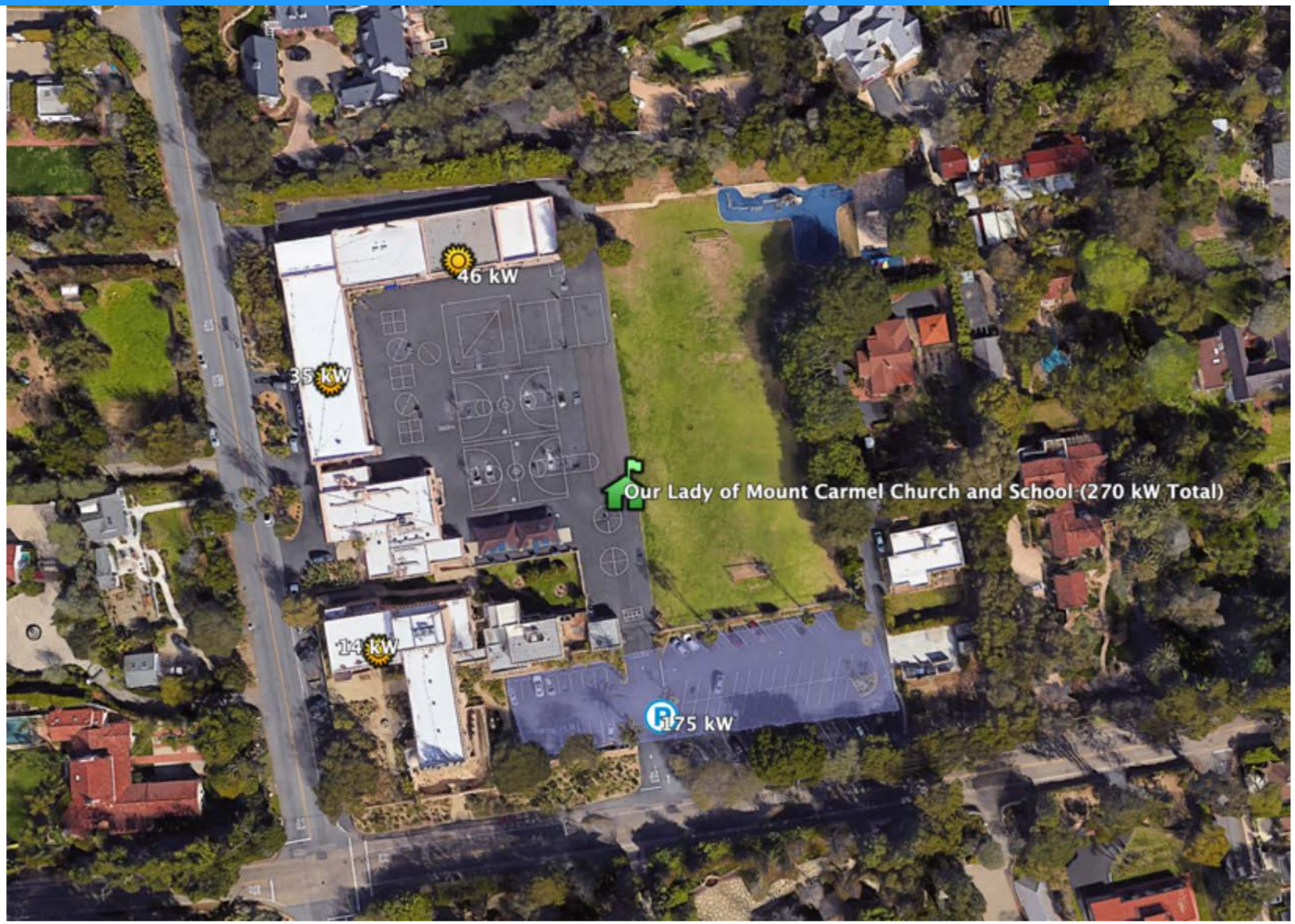
Montecito YMCA



Laguna Blanca School

Crane Country Day School

Our Lady of Mount Carmel Church and School



Back Up Slides

Feed in Tariffs (FITs) address the Wholesale DG market segment

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Project Size

50+ MW

500 kW

5 kW

Wholesale DG

Serves Local Loads

Central Generation

Serves Remote Loads

Retail DG

Serves Onsite Loads

Behind the Meter

Distribution Grid

Transmission Grid

Wholesale DG drove huge solar use in Germany

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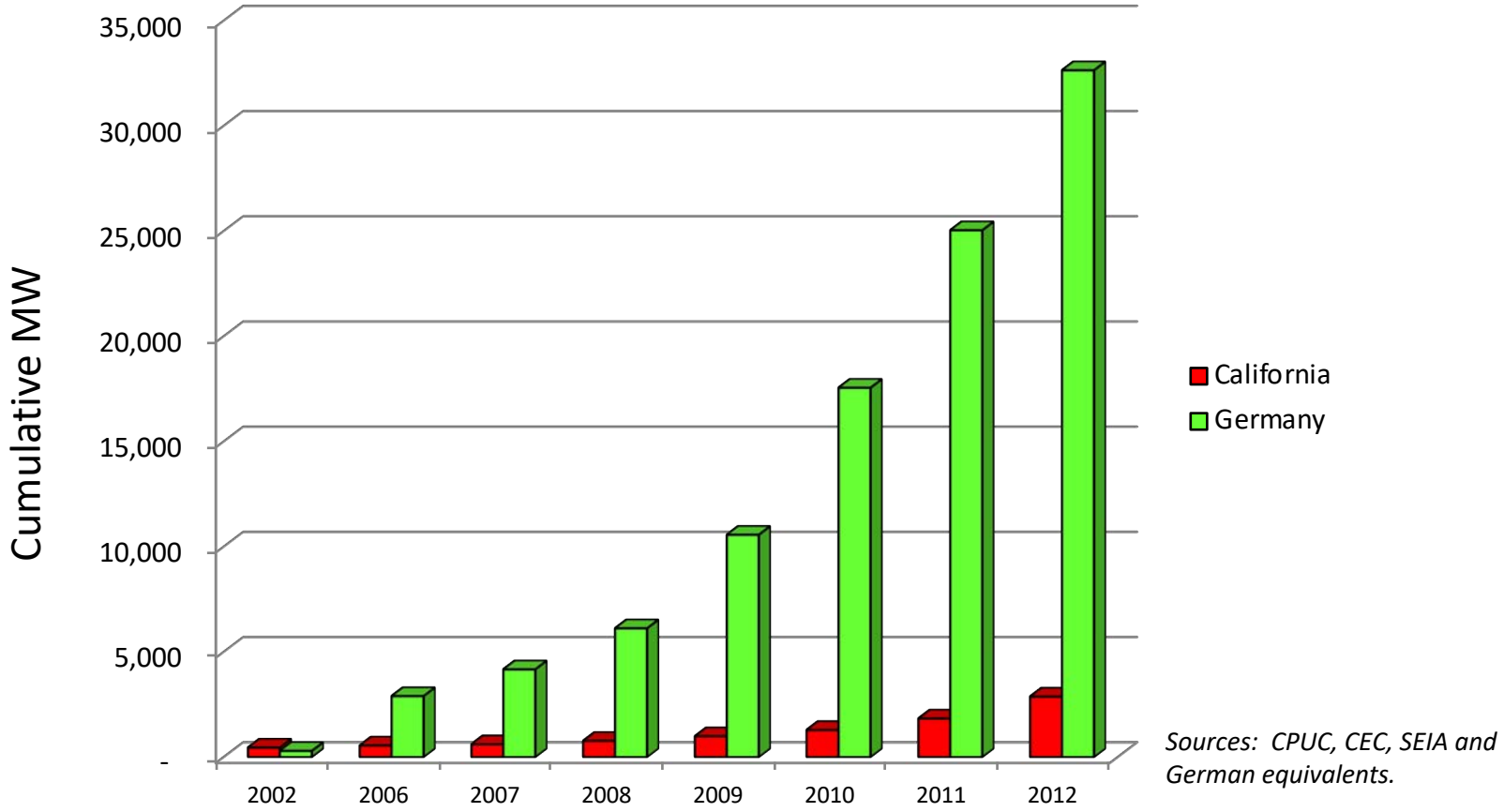
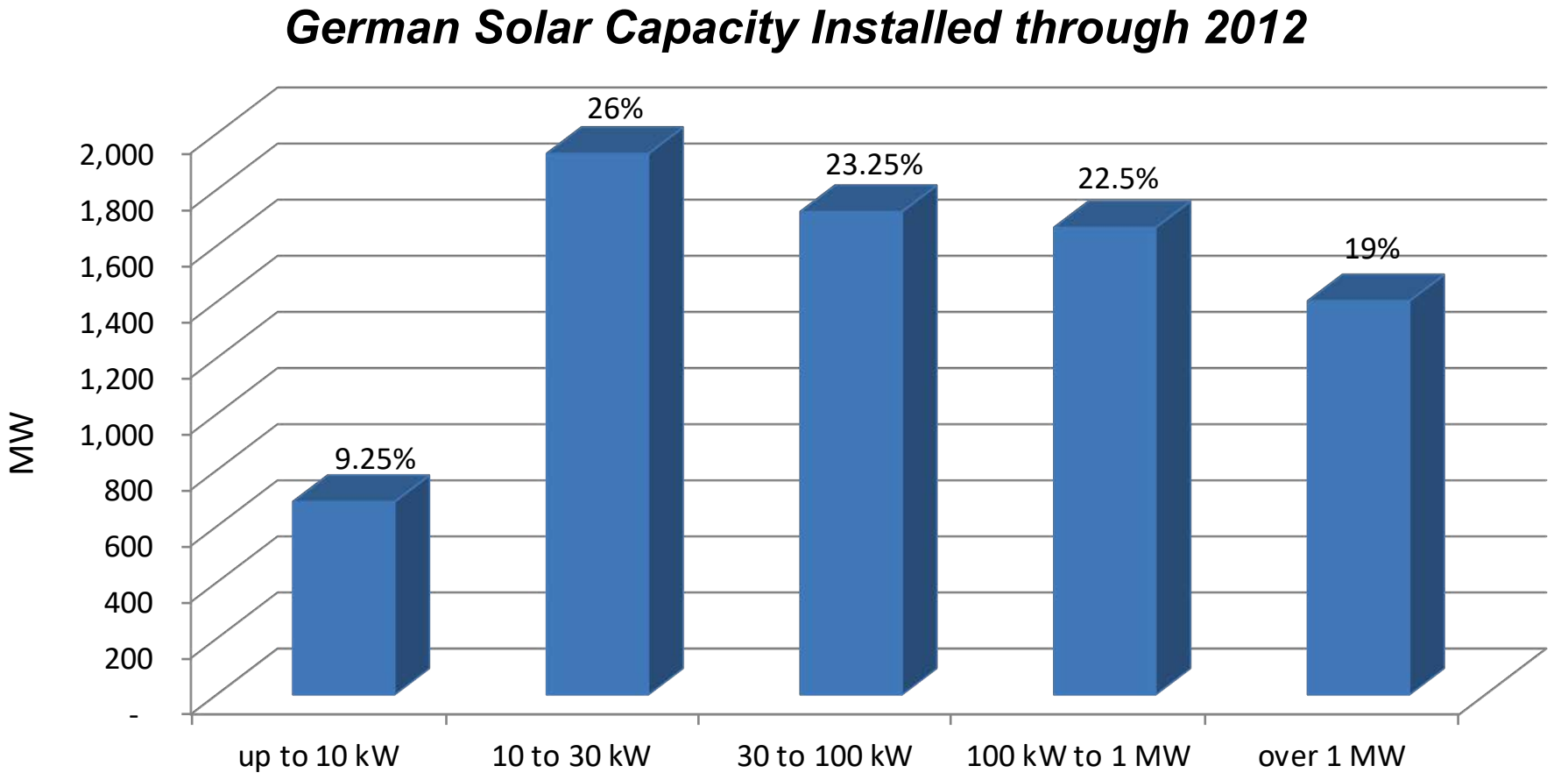
Solar Markets: Germany vs. California (2002-2012)



Sources: CPUC, CEC, SEIA and German equivalents.

Germany deployed over 10 times more solar than California in the decade from 2002 — despite California having 70% better solar resource.

The majority of German solar is local solar



Source: Paul Gipe, March 2012

Germany's solar deployments are almost entirely sub-2 MW projects on built-environments and interconnected to the distribution grid (not behind-the-meter).

German rooftop solar is 4 to 6 cents/kWh today

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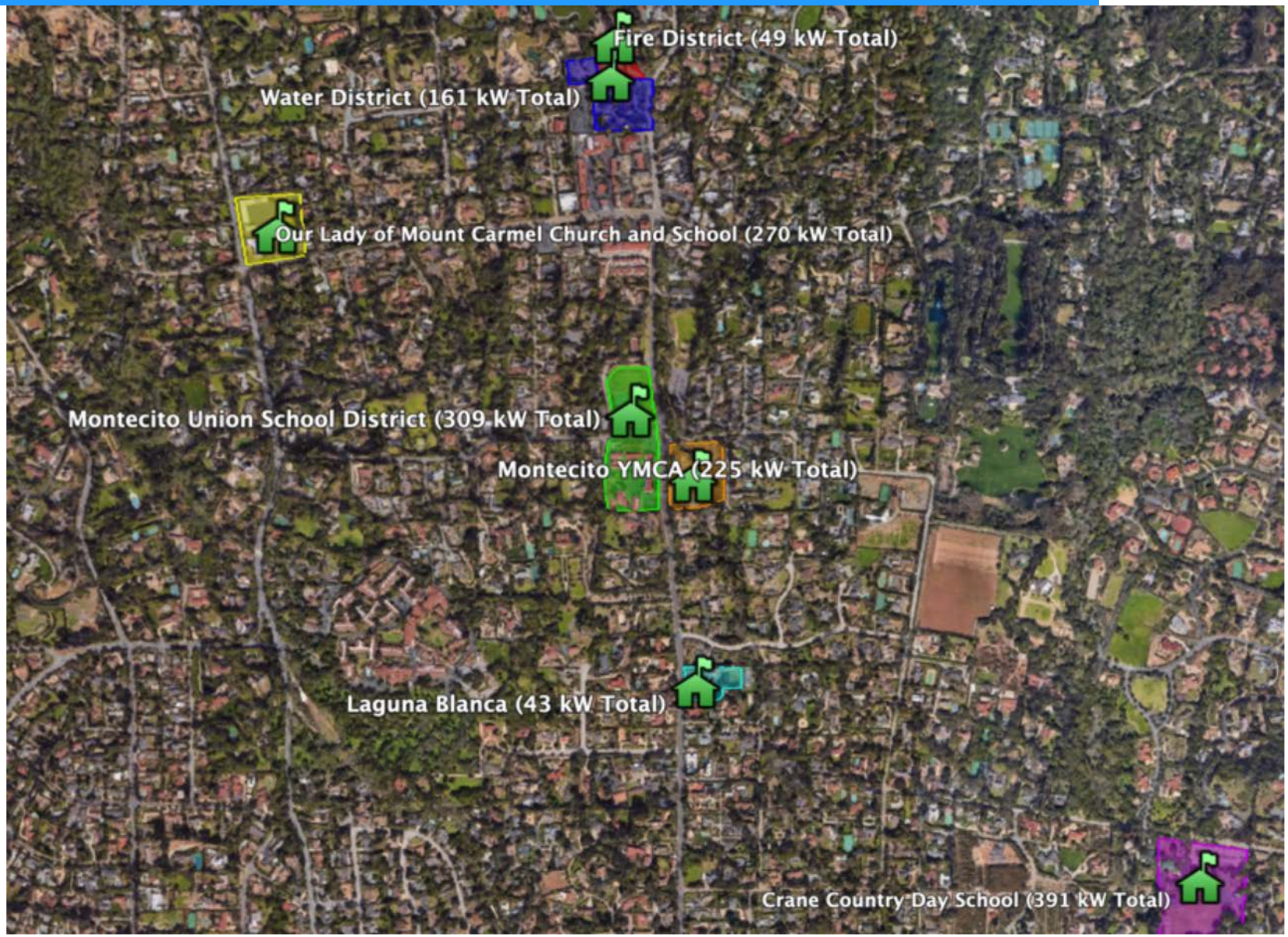
Project Size	Euros/kWh	USD/kWh	California Effective Rate $/kWh
Under 10 kW	0.1270	0.1359	0.0628
10 kW to 40 kW	0.1236	0.1323	0.0611
40.1 kW to 750 kW	0.1109	0.1187	0.0548
Other projects up to 750 kW*	0.0891	0.0953	0.0440

- Conversion rate for Euros to Dollars is €1:$1.07.
- California's effective rate is reduced 40% due to tax incentives and then an additional 33% due to the superior solar resource.

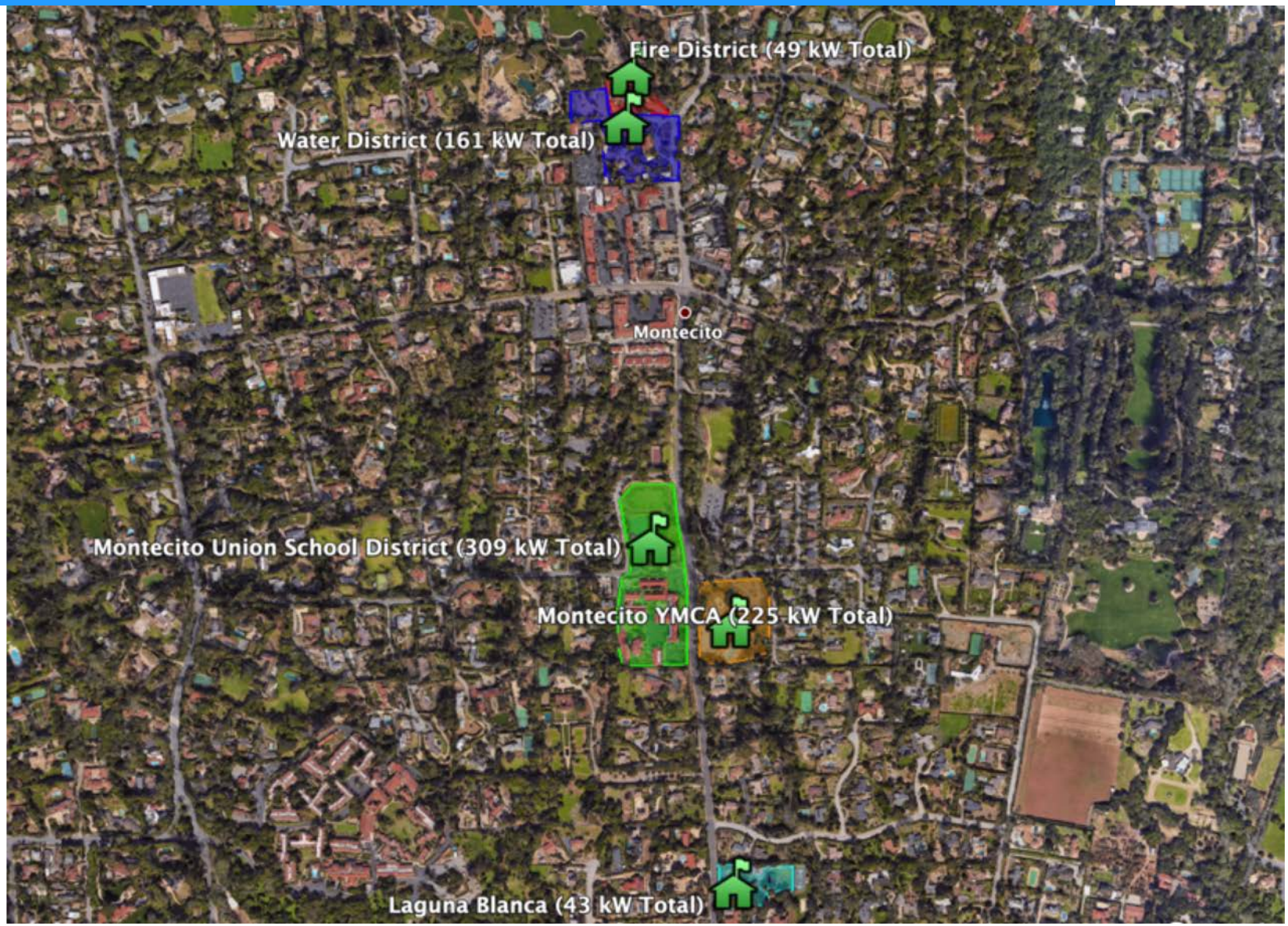
Replicating German scale and efficiencies would yield rooftop solar today at only between 4 and 6 cents/kWh to California ratepayers.

* For projects that are not sited on residential structures or sound barriers.

Upper Village critical facilities



Sites along Hot Springs Feeder



Community Microgrids obviate gas peakers

- Thanks in part to our analysis, California regulators have rejected Ellwood and signaled their intent to reject Puente as well
- “Let’s take this opportunity to move the Oxnard community into the clean energy future — which is here already.” *Carmen Ramirez, Mayor of Oxnard*
- Significant opportunity to leverage this work to prevent future new gas plant proposals across the country

Community Microgrids cheaper than gas peakers

- Leveraging our technical and economic expertise, the Clean Coalition conducted an analysis to determine the viability of solar+storage as a better alternative