



Community Microgrids & Solar Microgrids

Economic, environmental & resilience benefits

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Mission

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

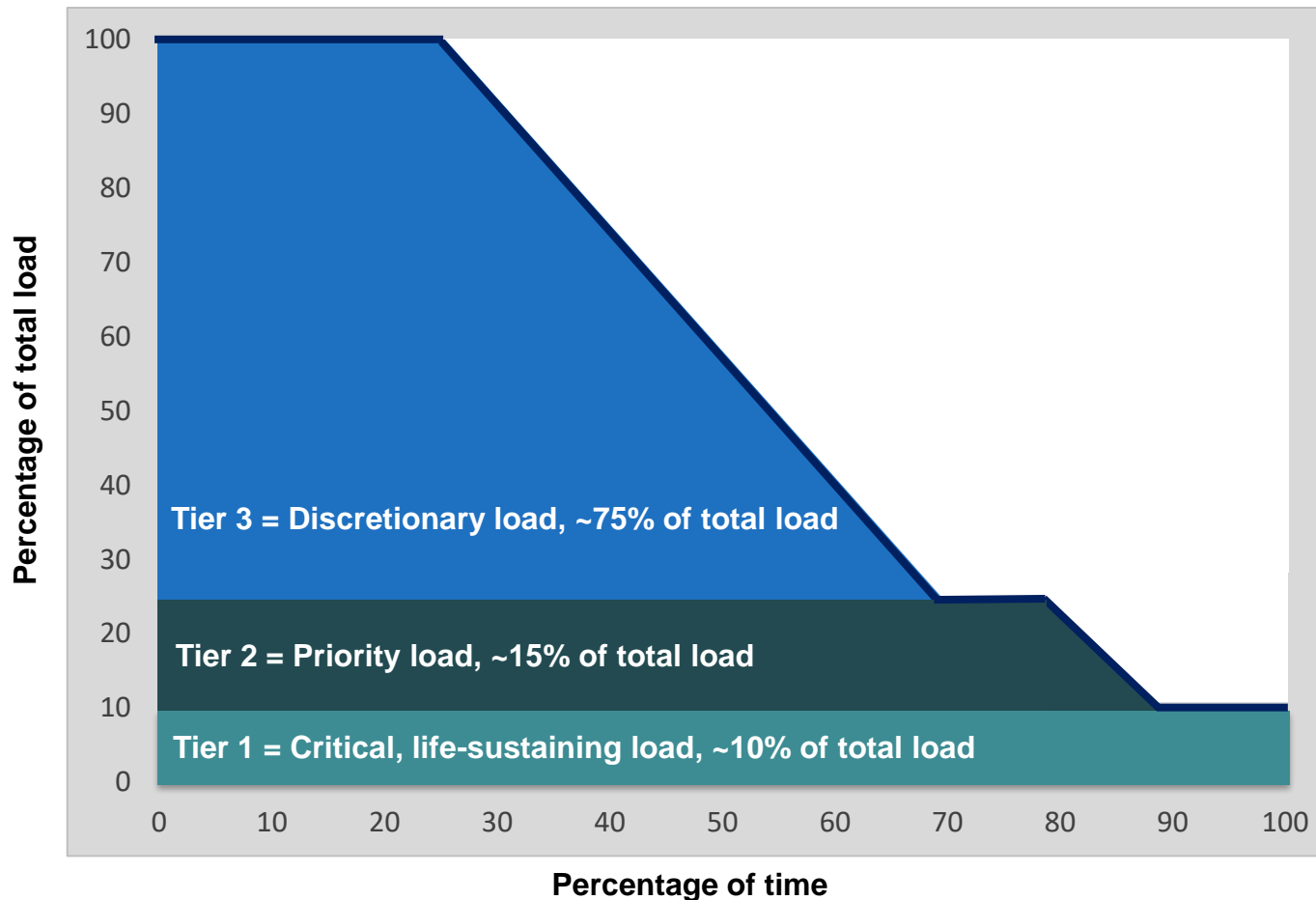
100% renewable energy end-game

- 25% local, interconnected within the distribution grid and facilitating resilience without dependence on the transmission grid.
- 75% remote, dependent on the transmission grid for serving loads.

Value-of-resilience (VOR) depends on tier of load

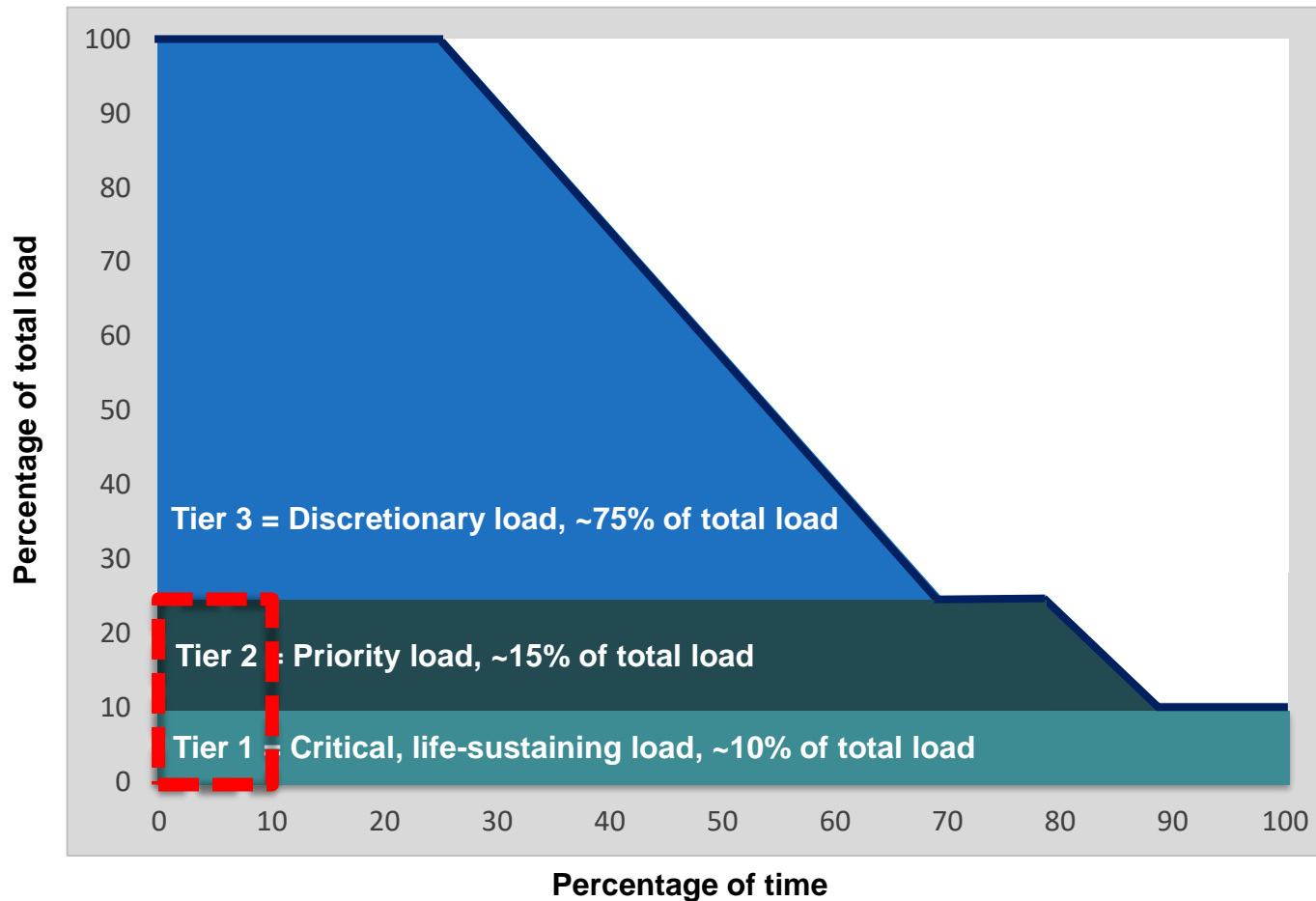
- Everyone understands there is significant value to resilience provided by indefinite renewables-driven backup power, especially for the most critical loads
 - But, nobody has quantified this value of unparalleled resilience.
 - Hence, there is a substantial economic gap for renewables-driven microgrids.
- The Clean Coalition aims to establish a standardized [value-of-resilience](#) (VOR) for critical, priority, and discretionary loads that will help everyone understand that premiums are appropriate for indefinite renewables-driven backup power to critical loads and almost constant backup power to priority loads, which yields a configuration that delivers backup power to all loads a lot of the time
- The Clean Coalition's VOR approach aims to standardize resilience values for three tiers of loads:
 - Tier 1 are mission-critical & life-sustaining loads and warrant 100% resilience. Tier 1 loads usually represent about 10% of the total load.
 - Tier 2 are priority loads that should be maintained as long as long as doing so does not threaten the ability to maintain Tier 1 loads. Tier 2 loads usually represent about 15% of the total load.
 - Tier 3 are discretionary loads make up the remaining loads, usually about 75% of the total load. Maintained when doing so does not threaten Tier 1 & 2 resilience.





Percentage of time online for Tier 1, 2, and 3 loads for a Solar Microgrid designed for the University of California Santa Barbara (UCSB) with enough solar to achieve net zero and 200 kWh of energy storage per 100 kW solar.

Diesel generators are designed for limited resilience



A typical diesel generator is configured to maintain 25% of the normal load for two days. If diesel fuel cannot be resupplied within two days, goodbye. This is hardly a solution for increasingly necessary long-term resilience. In California, Solar Microgrids provide a vastly superior trifecta of economic, environmental, and resilience benefits.

Goleta Load Pocket (GLP) Community Microgrid case study

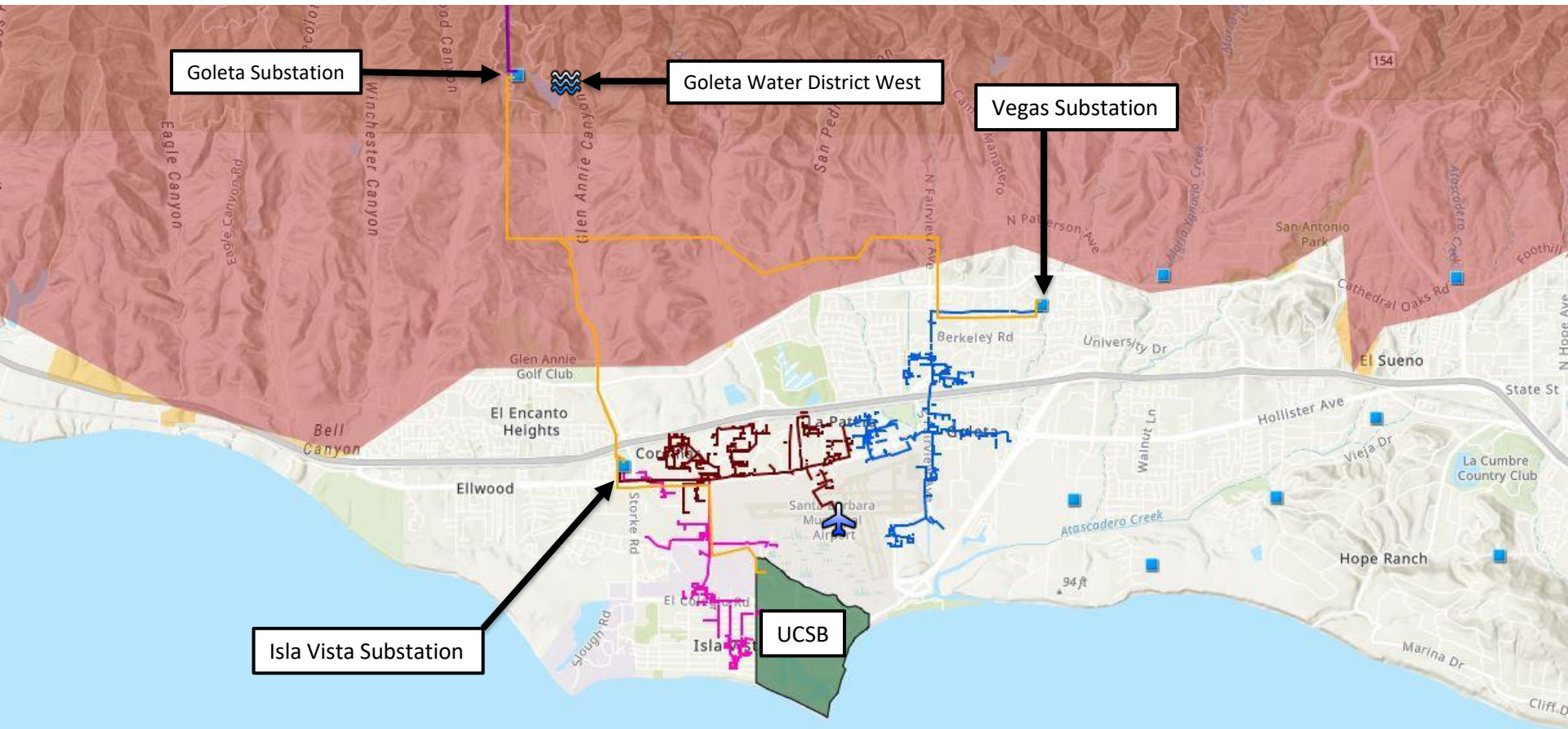
Goleta Load Pocket (GLP) and attaining resilience

The GLP is the perfect opportunity for a comprehensive Community Microgrid



- GLP spans 70 miles of California coastline, from Point Conception to Lake Casitas, encompassing the cities of Goleta, Santa Barbara (including Montecito), and Carpinteria.
- GLP is highly transmission-vulnerable and disaster-prone (fire, landslide, earthquake).
- **200 megawatts (MW) of solar and 400 megawatt-hours (MWh) of energy storage** will provide 100% protection to GLP against a complete transmission outage (“N-2 event”).
 - 200 MW of solar is equivalent to about 5 times the amount of solar currently deployed in the GLP and represents about 25% of the energy mix.
 - Multi-GWs of solar siting opportunity exists on commercial-scale built environments like parking lots, parking structures, and rooftops; and 200 MW represents about 7% of the technical siting potential.
 - Other resources like energy efficiency, demand response, and offshore wind can significantly reduce solar+storage requirements.

Target 66kV feeder at the core of the GLP



Legend

- 220 kV Transmission
- 66 kV Feeder #4311
- Substations
- 16kV Gladiola Feeder
- 16kV Gaucho Feeder
- 16kV Professor Feeder

- Tier 3 Fire Threat
- Tier 2 Fire Threat

University of California Santa Barbara (UCSB)

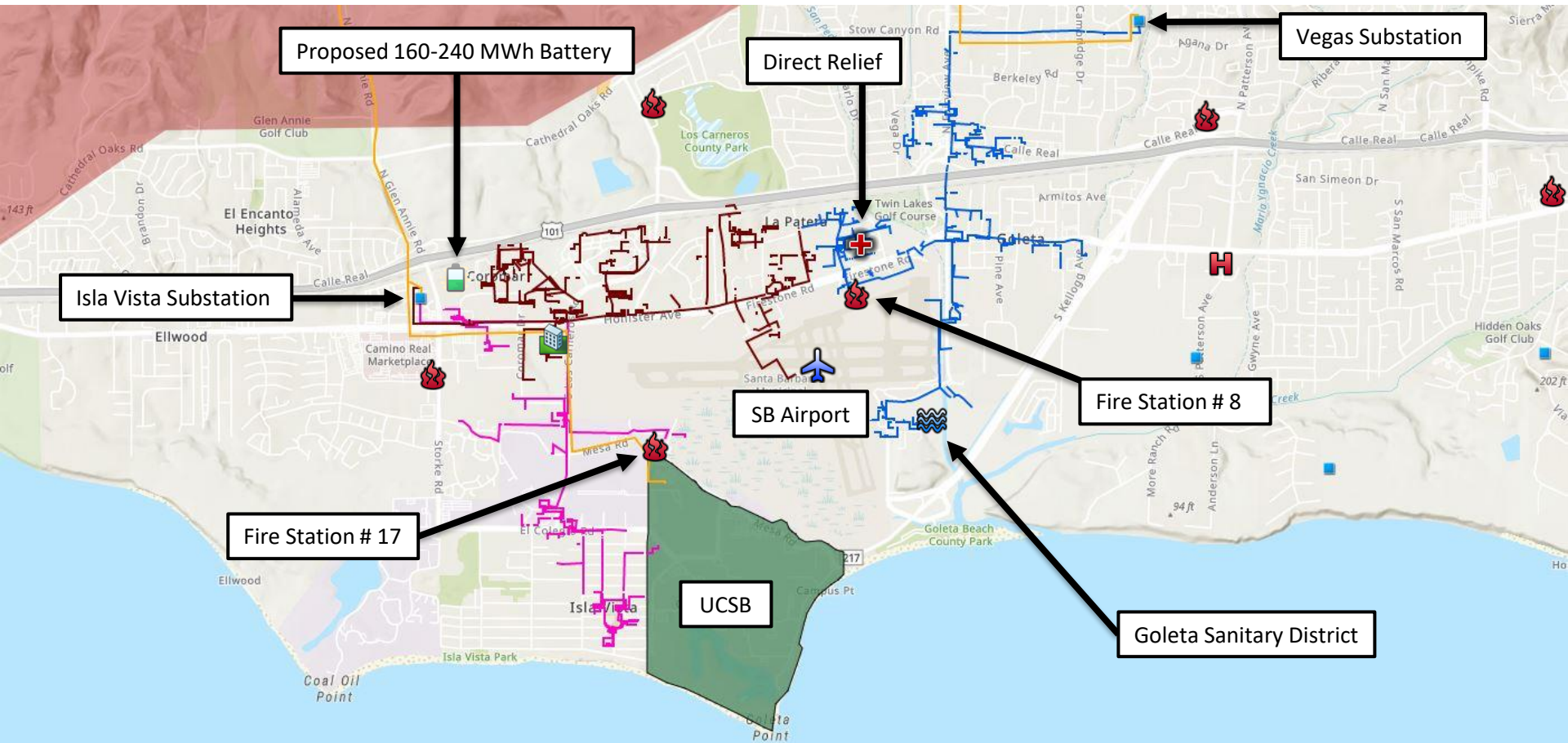


Santa Barbara Airport


















Sanitary or Water Districts

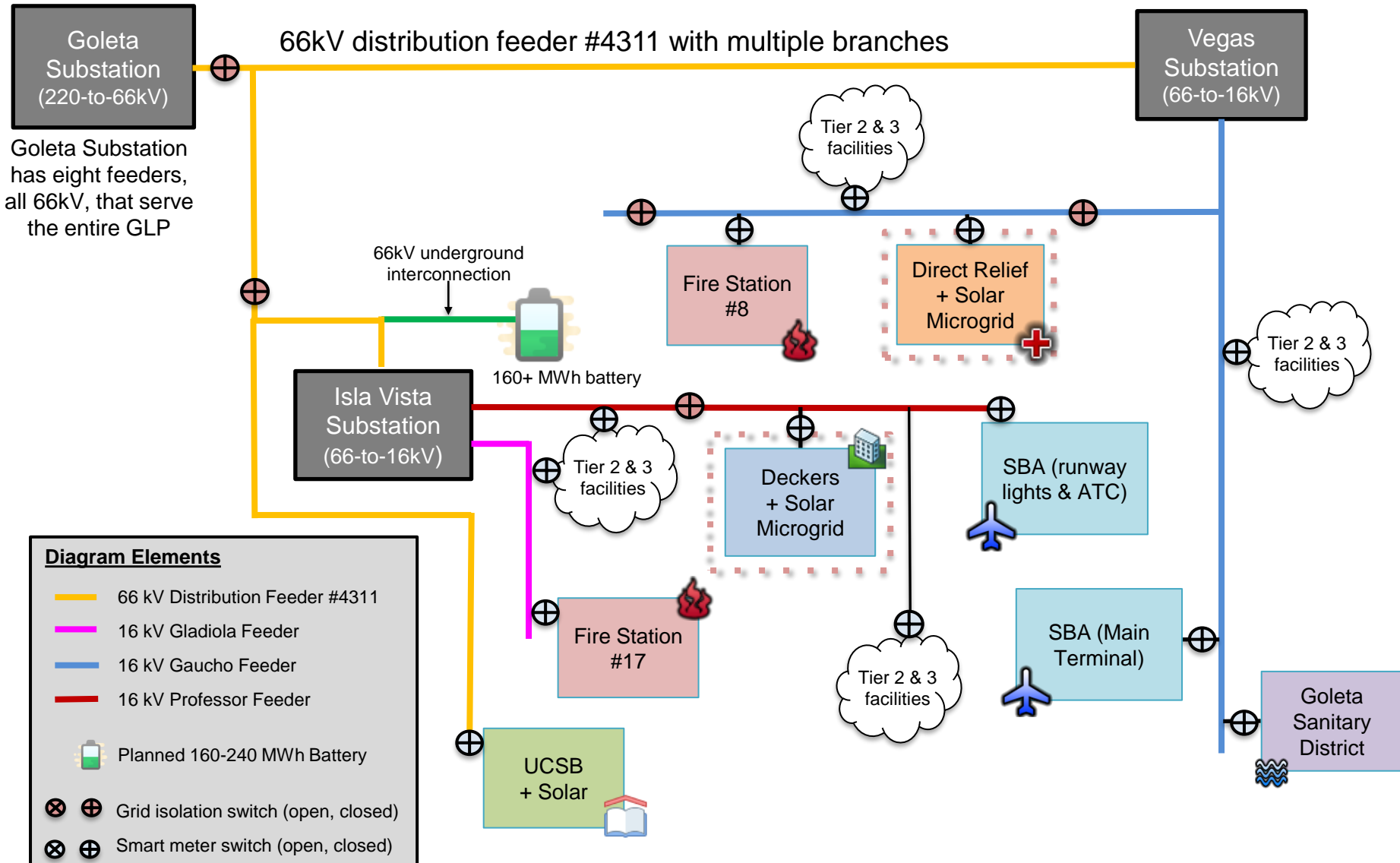
Target 66kV feeder serves critical GLP loads



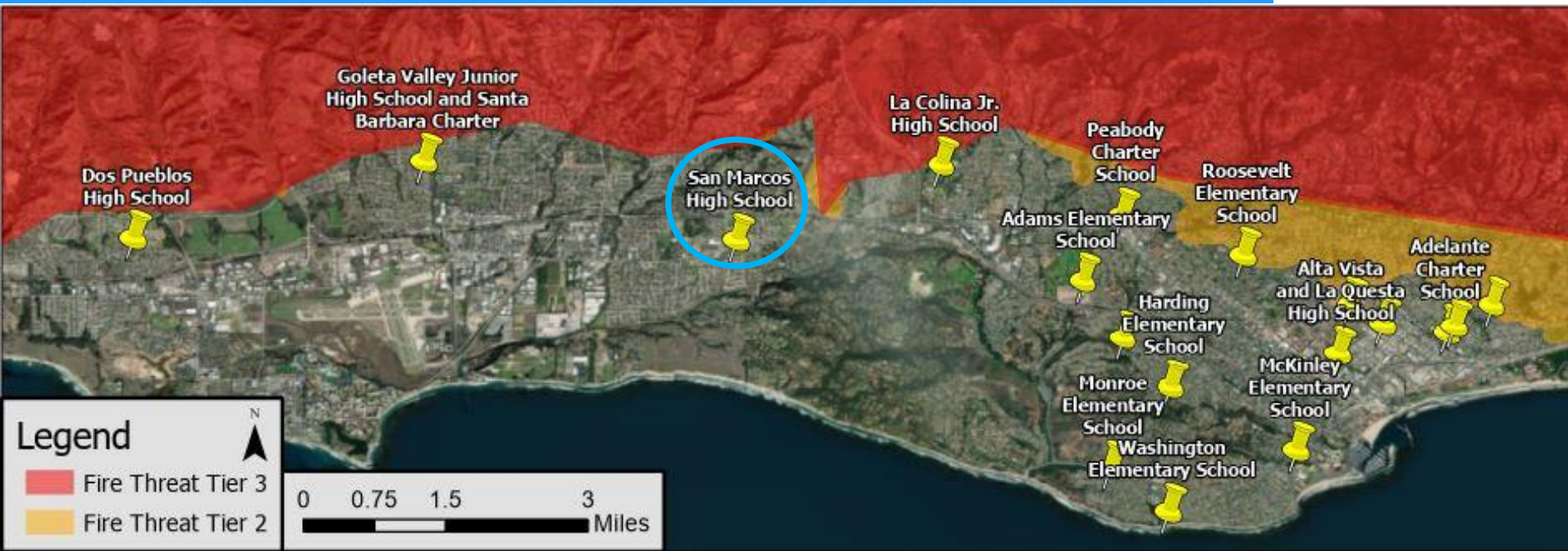
Legend

- | | | | |
|---|---|--|--|
|  220 kV Transmission |  16kV Gladiola Feeder |  Tier 3 Fire Threat |  Goleta Valley Cottage Hospital |
|  66 kV Feeder #4311 |  16kV Gaucho Feeder |  University of California Santa Barbara |  Direct Relief |
|  Substations |  16kV Professor Feeder |  Fire Stations |  Deckers |
|  Santa Barbara Airport | |  Sanitary or Water Districts |  Proposed 160-240 MWh Battery |

Target 66kV feeder grid area block diagram

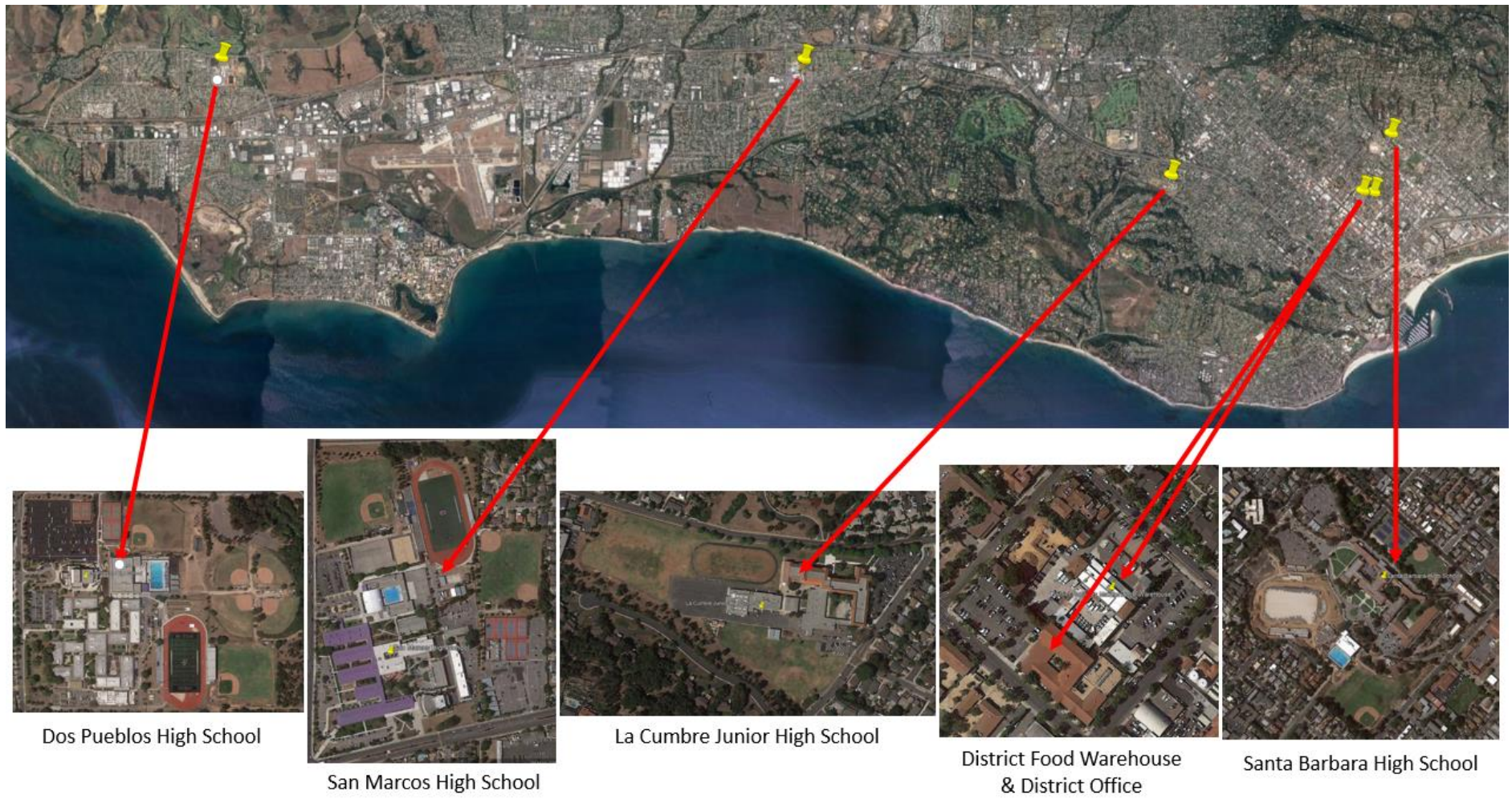


Santa Barbara Unified School District (SBUSD) case study

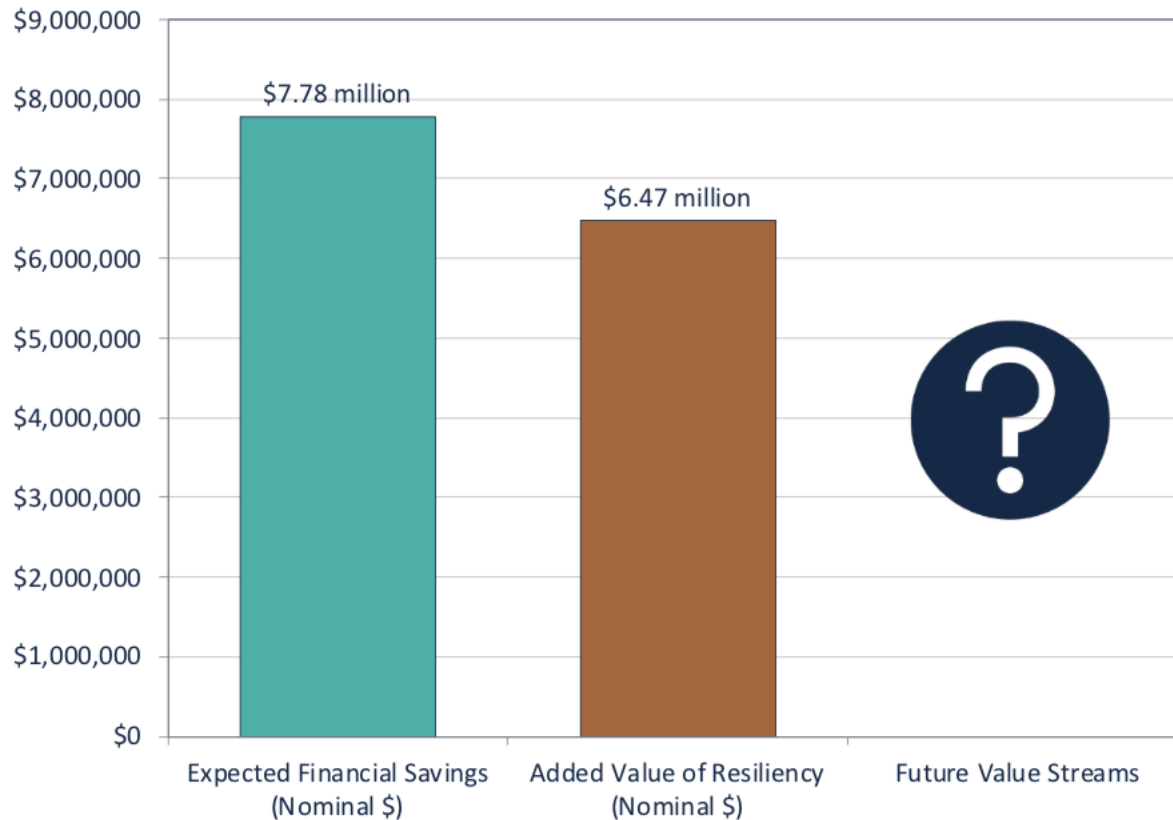


- The entire Santa Barbara region is surrounded by extreme fire risk (earthquake & landslide risk too) and is extremely vulnerable to electricity grid outages.
- The SBUSD is a major school district that increasingly recognizes the value-of-resilience (VOR) and has embraced the Clean Coalition's vision to implement Solar Microgrids at a number of its key schools and other critical facilities.
- SMHS is in the middle of the extensive SBUSD service area.

Six SBUSD Solar Microgrid sites



Lifetime (28-year) Bill Savings and Added Value of Resiliency

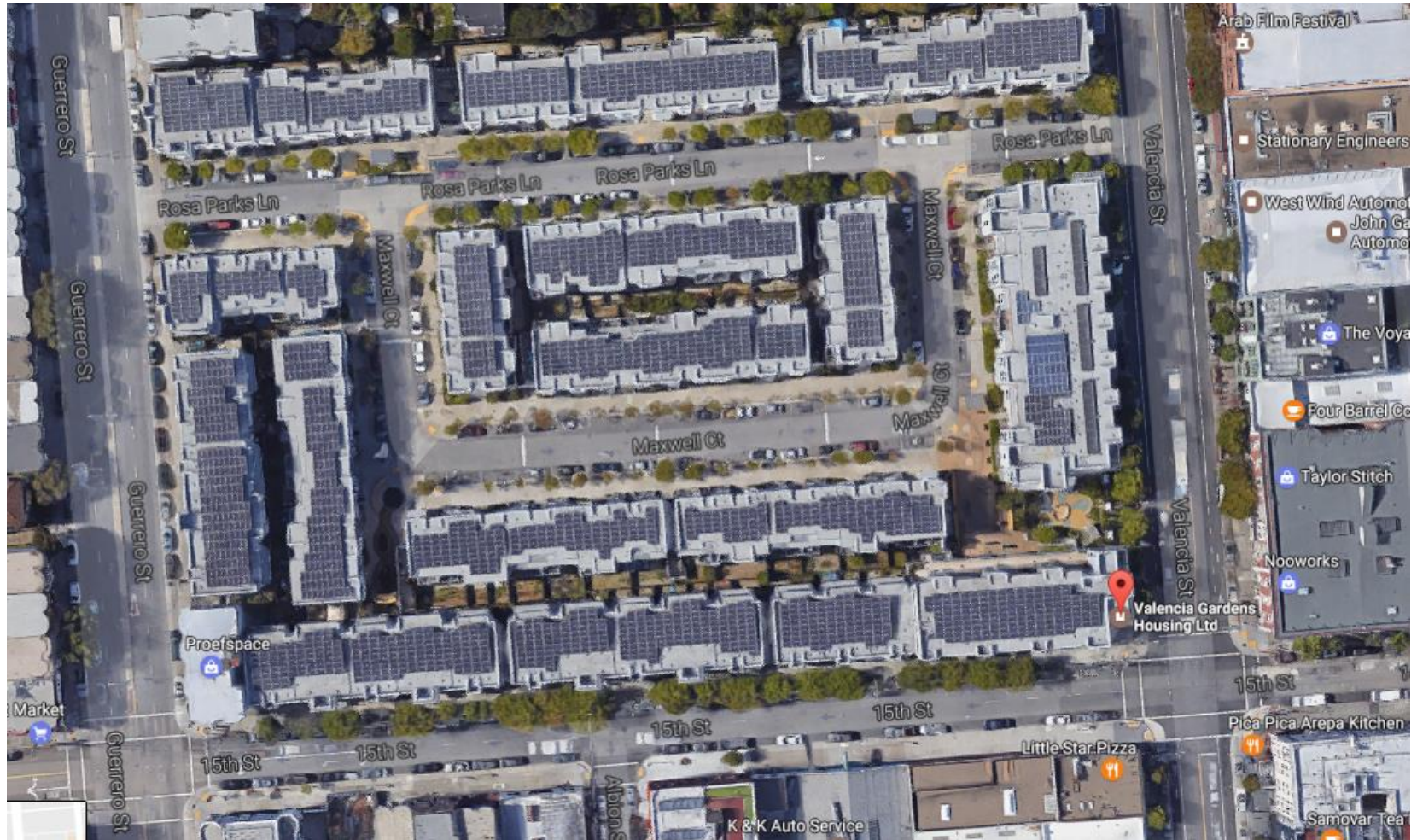


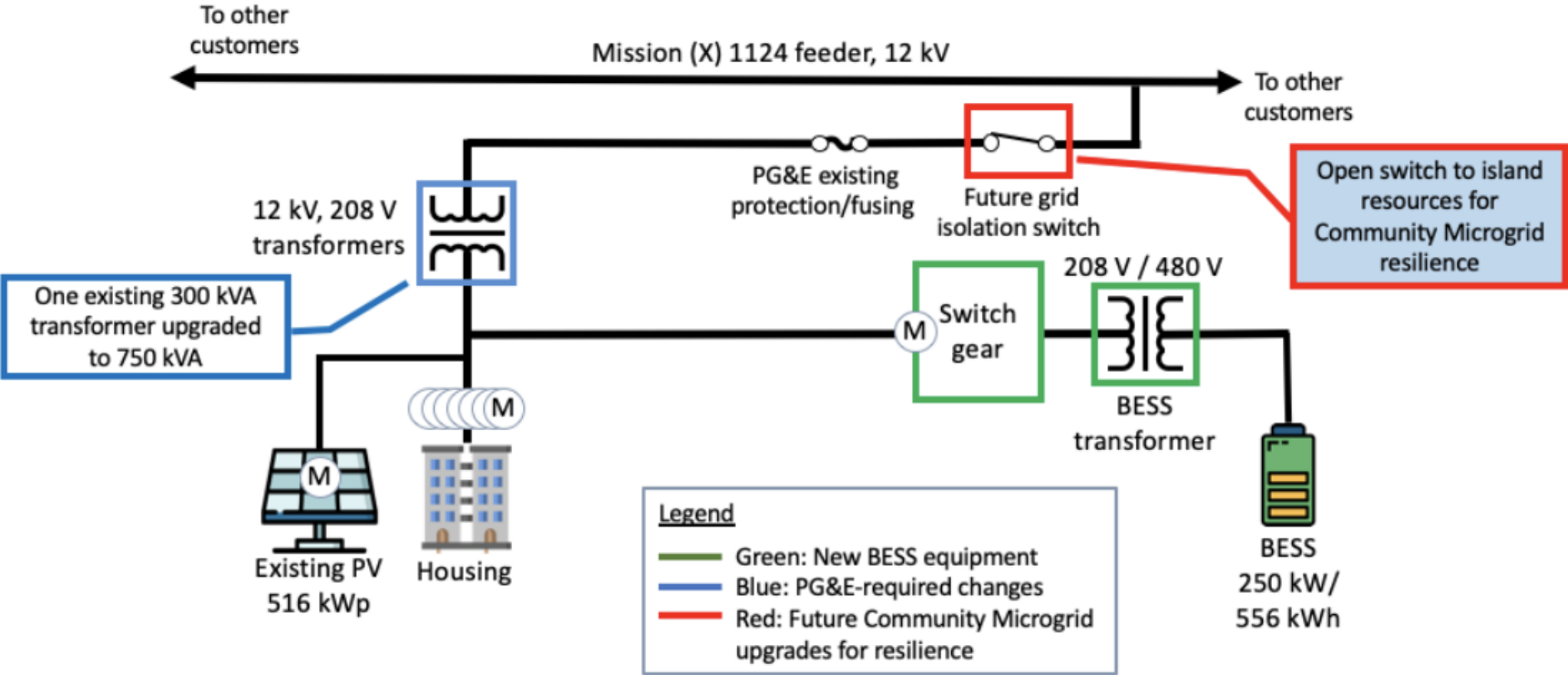
Valencia Gardens Energy Storage (VGES) case study

Valencia Gardens Apartments in San Francisco



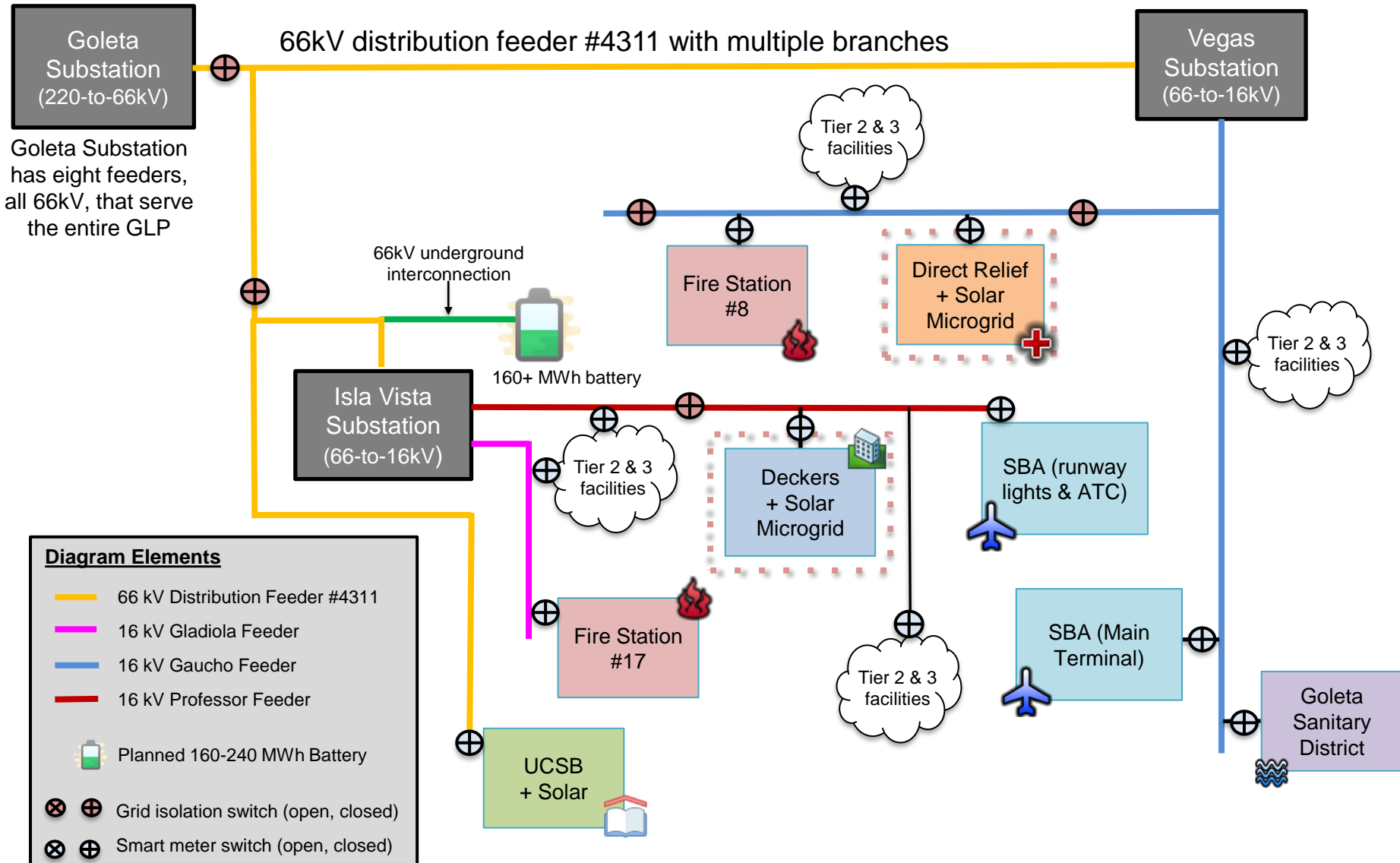
Lots of solar on the Valencia Gardens Apartments

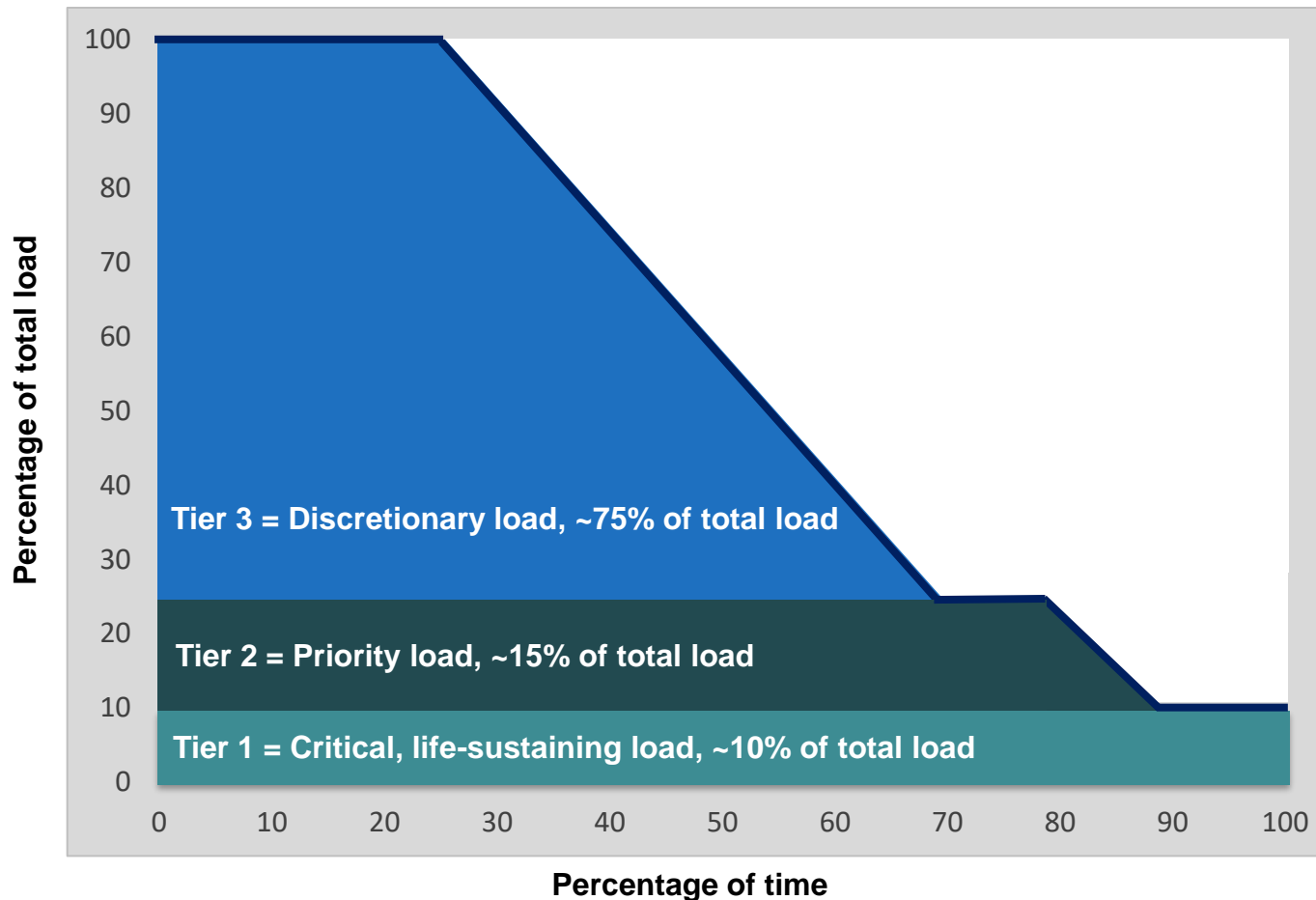




Planning for resilience begins with tiering





Target 66kV feeder grid area block diagram





Percentage of time online for Tier 1, 2, and 3 loads for a Solar Microgrid designed for the University of California Santa Barbara (UCSB) with enough solar to achieve net zero and 200 kWh of energy storage per 100 kW solar.

		Facility tiers		
		Tier 1 facility	Tier 2 facility	Tier 3 facility
Load tiers	Tier 1 load			
	Tier 2 load			
	Tier 3 load			

-  = Critical for the entire community, such as Tier 1 loads at Tier 1 facilities like fire stations
-  = Priority for the entire community, such as Tier 2 loads at Tier 1 facilities and Tier 1 loads at Tier 2 facilities like multi-unit housing facilities that can provide safe and easy sheltering in place
-  = Priority for individual facilities but not the entire community
-  = Discretionary loads that are not impactful to the community, whether on or off