California Accelerates Major PV+BESS Project

By John Benson

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1. Introduction

Your author has deep experience working with the California Energy Commission (CEC) on innovative grid resource programs. This experience started when I worked for Comverge in the early 2000s. On their website the CEC describes their mission as *"As the state's primary energy policy and planning agency, the Energy Commission plays a critical role in creating the energy system of the future - one that is clean, is modern, and ensures the fourth largest economy in the world continues to thrive.*" My earlier experience was on their demand response programs, and I participated in CEC's Demand Response Working Group 3 (WG3). This group's work led to a state-wide AMI deployment by the three major IOUs in California (and other public utilities). I helped to write the WG3 Report, and managed a small demand response pilot project at Sacramento Municipal Utility District (SMUD). As part of their "…energy policy and planning…" responsibilities, they tend to be heavily involved in advanced generation projects, like the one described below.

The California Energy Commission (CEC) approved the Darden Clean Energy Project, the first to be fast tracked under its Opt-In Certification program.

The CEC said that this battery storage project is destined to be the largest in world. Up to 4,600 MW-hr. battery energy storage system (BESS) will be paired with a solar installation of 300 million solar modules providing 1.1 GW of solar, it will generate enough electricity to power 850,000 homes for four hours.

The Darden project, which is owned by IP Darden I, LLC, a subsidiary of Intersect Power, will connect to the PG&E grid and be located on 9,500 acres of land in western Fresno County that the CEC said is no longer able to support agricultural production.

The Opt-In Certification program allows advanced projects to be quickly permitted. Per the CEC's Website: *"Permitting is crucial to deploy renewable energy power plants, which are essential to meet the state's climate goals. With half a century of permitting experience under the California Environmental Quality Act, Assembly Bill 205 (2022) has broadened the California Energy Commission's (CEC's) authority. This expansion allows the CEC to oversee the permitting of clean and renewable energy facilities, including solar photovoltaic, onshore wind, and energy storage systems, and facilities that produce or assemble clean energy technologies or their components. Known as the Opt-In Certification Program, this permitting process offers developers an optional pathway to submit project applications, facilitating faster deployment of renewable technologies.*[1]

[1] https://www.energy.ca.gov/programs-and-topics/topics/power-plants/opt-certification-program

2. Darden Clean Energy Project

IP Darden I, LLC and Affiliates (Applicant) propose to construct and operate the Darden Clean Energy Project on approximately 9,500 acres in western Fresno County. The project consists of a 1,150-megawatt (MW) solar photovoltaic (PV) facility, an up to 4,600 megawatt-hour battery energy storage system (BESS), a 34.5-kilovolt (kV) to-500 kV grid step-up substation, a 15-mile 500 kV generation intertie (gen-tie) line, and a 500 kV utility switchyard. The project would interconnect to the existing Pacific Gas and Electric Company (PG&E) Los Banos-Midway #2 500 kV transmission line. The project would be located in an agricultural area of unincorporated Fresno County south of the community of Cantua Creek.[2]

The solar PV facility would be made up of approximately 3,100,000 solar panels, inverter-transformer stations, and an electrical collection system, and would be located on lands currently owned by Westlands Water District that would be purchased by IP Darden. The 500 kV gen-tie line would be sited within an approximate 200-foot-wide easement on private lands. Following construction of the utility switchyard by IP Darden, ownership and operations would transfer to PG&E. The BESS would be capable of providing up to 1,150 MW of electricity for four-hours.

2.1. Project Benefits

Adds significant clean energy capacity and supports enhanced grid reliability that will help California achieve its clean energy and climate goals.

Includes a community benefits plan that commits the applicant to invest more than $2 million over the next decade in community-based initiatives and programs in Fresno County. One such commitment is for $320,000 with Centro La Familia Advocacy Services, a non-profit that supports crime victims, promotes family wellness and encourages civic engagement in rural communities.

Creates more than 2,000 construction jobs that pay prevailing wages.

Generates an estimated $169 million in economic benefits to the local area over the project life.

2.2. Why Battery Storage?

Battery storage is crucial for balancing California's power supply as the state transitions to 100 percent clean electricity by 2045.

By capturing excess energy during peak production times and discharging it when there's low or no production, battery storage systems maximize the use of clean energy resources, smooth out fluctuations in supply, enhance grid reliability, and reduce dependence on fossil fuels.

California leads the nation in battery storage, with more than 200 utility-scale battery energy storage systems and more than 250,000 commercial and residential systems statewide. Combined, these resources provided more than 15,700 MW of battery storage output.

[2] California Energy Commission, "Darden Clean Energy Project," 2025, https://www.energy.ca.gov/powerplant/solar-photovoltaic-pv-battery-energy-storage/darden-clean-energy-project

Author's comment: As one of the above "…*more than 250,000 commercial and residential systems*…" your author has operated a small battery energy storage system (10 kwh) for about the last year. This has helped reduce my net electric energy consumption by more than 90%.

However, recently I was shocked, when the "yearly true-up billing" from PG&E charged me about $300. I quickly called PG&E to make sure I understood this, and their nice employee patiently explained it to me. He also indicated that my PV (solar roof) plus battery energy storage system was performing extremely well by reducing my consumption by around 90% (gee, I was hoping for 100%). See the posts summarized and linked below for more details on this project.

Rooftop Solar Energy Tug of War, Part 5, Real World Project

- Prequalification

https://energycentral.com/c/cp/rooftop-solar-energy-tug-war-part-5-real-world-project

Rooftop Solar Energy Tug of War, Part 6, Selection, Survey & Design

This paper will focus on the project phases between and including the contractor selection, the site survey and the creation and approval of the design.

https://energycentral.com/c/cp/rooftop-solar-energy-tug-war-part-6-selection-survey-design

Rooftop Solar Energy Tug of War, Part 7, implementation and results

This paper, as planned, is the final episode in this very long series on residential solar energy projects in California, and this part, the prior parts 5 and 6 are specifically about my project. The prior part of this paper is linked in the Intro of this paper, and part 5 is linked in the Intro of part 6.

https://energycentral.com/c/cp/rooftop-solar-energy-tug-war-part-7-implementation-and-results

3. Another Major California Battery Storage Project

California today approved a $42 million grant to International Electric Power to build a long-duration energy storage project at Marine Corps Base Camp Pendleton in San Diego County. The project will provide electricity to the statewide grid and backup power to the base for up to 14 days in the event of power outages. The installation will help enhance the resiliency of California's electricity grid, the region, and the base, providing a replicable model that can be applied broadly.[3]

The California Energy Commission's award is part of the state's Long-Duration Energy Storage Program, funded by Governor Gavin Newsom's historic multi-billion-dollar commitment to combat climate change. The program invests in demonstrations of non-lithium-ion technologies across the state to create a diverse portfolio of 8-hour-plus energy storage technologies. This is the largest grant awarded under the program.

[3] Governor Gavin Newsom, "State boosts critical battery storage project at Camp Pendleton with $42 million investment," December 11, 2024, https://www.gov.ca.gov/2024/12/11/state-boosts-critical-battery-storage-project-at-camp-pendleton-with-42-million-investment/

Adding more battery storage is a critical part of the Governor's build more, faster agenda delivering infrastructure upgrades throughout the state. Find projects building your community at build.ca.gov.

"Since the beginning of my administration, California has been on the front lines of the global battery revolution. We've ramped up battery storage capacity by more than 1,600% – bringing us a quarter of the way to meeting our projected need. Battery storage projects like this one at Camp Pendleton are vital to building a reliable and resilient electric grid in the face of climate extremes."

-Governor Gavin Newsom

The project, to be installed at the Camp Pendleton's Haybarn Energy Reliability Center, will initially provide 6 megawatts (MW)/48 megawatt hours (MWh) of long-duration energy storage. Plans call for the system to later be expanded to a 50 MW/400 MWh installation.

As part of the Haybarn Energy Reliability Center, the project awarded today will help support the Marine Corps' largest West Coast expeditionary training facility, encompassing more than 125,000 acres in San Diego County. The base is one of the Department of Defense's busiest installations, offering a broad spectrum of training facilities for active and reserve Marine, Army, and Navy units as well as national, state, and local agencies. It supports more than 70,000 military and civilian personnel and their families.

It is expected to be operational in summer 2027 and will help support grid reliability, reduce greenhouse gas emissions by replacing fossil fuel powered back-up generation, and demonstrate solutions that can be scaled and replicated to meet the state's climate and clean energy goals.

3.1. Future Plans

The state is projected to need 52,000 MW of energy storage capacity by 2045. Today, it's a quarter of the way there. Typical battery storage, which mostly encompasses lithium-ion technology, has an industry standard of 2 to 4 hours of discharge. Long-duration energy storage can currently provide power for up to 100 hours.

California has more than 13,300 MW of battery storage installed today. Within the past six years, the state has grown its battery storage capacity by more than 15 times, up from just 770 MW in 2019.

The recent surge in battery storage has significantly enhanced California's ability to maintain grid stability during extreme weather. Throughout the summer of 2024, battery storage reliably discharged to support the grid during the net peak hours – a critical stretch of the day when the sun sets and solar resources rapidly go offline.

Battery storage discharge to the grid increased from 6,000 MW this spring to more than 8,000 MW this summer.

Final author's comment: California also has over 3,500 MW of hydroelectric pumped energy storage capacity. See the post summarized and linked below, section 3.2.2 for details.

Overloads – Yesterday's and Today's: *Most of my readers know that I live in California in the United States. The U.S. and especially California has a very dynamic economy, that is also growing very rapidly. This has led many energy professionals to wonder if we will "run out of energy." That is, will our existing energy organization be unable to keep up with ever-expanding economy? Good question, but the good news is that our energy infrastructure is an integral part of our economy, and is being driven by the same market forces as our economy in general, and thus it probably will keep up.*

https://www.energycentral.com/energy-management/post/overloads---yesterday-s-and-today-s-2HBOMpGShA4qy6G