Six Largest Western U.S. BESS Projects

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1. Introduction

I've been interested in large Battery Energy Storage System (BESS) projects lately, so I decided to look for the largest of these systems that are being built in or near California (my home state). Also, I'm interested in BESS Paired with Solar, so below I am covering these projects starting with the largest. Since many of my readers are not in California, I've put a map of California below with the project locations.

Starting on Page 2 I will put project descriptions for each of the six projects that I have identified, followed by a summary.

2. Darden Battery Energy Storage System

The Darden BESS is set to become the largest battery storage project in the US once completed. Developed by IP Darden I, LLC, a subsidiary of Intersect Power, the project integrates a 1,150 MW solar photovoltaic facility with 1,150 MW / 4,600 MWh of storage capacity. Spread across 9,500 acres of non-arable land in western Fresno County, California the facility will connect to the Pacific Gas & Electric Company (PG&E) grid.[1]

The project will deploy around 3.1 million solar panels and is designed to supply enough electricity to power 850,000 homes. The BESS has supply for four hours without input power from the PV. It directly supports California's goal of achieving 100 percent zero-carbon electricity sales by 2045, as mandated under Senate Bill 100. Approval was granted through the state's program, which expedites environmental review to 270 days.

Safety measures remain a critical component of the project. California has updated its fire code and utility commission regulations following incidents at other storage facilities. The Darden project incorporates these enhanced standards, aligning with state efforts to ensure safe deployment of large-scale lithium-ion systems. The Darden was approved in June 2025, and expected to be completed by 2028.

3. Copper Rays BESS Project

This system is in Nye County, Nevada (40 miles west of Las Vegas). The Copper Rays Solar Project combines a 700 MW photovoltaic facility with 700 MW of battery energy storage on approximately 4,414 acres of Bureau of Land Management land in Nye County, Nevada. The project will connect to the regional transmission system through a generation tie line to the existing Gamebird Substation northwest of the site.

Construction is planned in two phases and is expected to take about 54 months. Once complete, the project will deliver renewable energy to support regional grid stability and contribute to Nevada's clean energy targets.

The Bureau of Land Management has initiated a 90-day public comment period on the project to gather input on its design, environmental considerations, and community impacts. The permitting process will determine the final scope and timeline of development. Currently no completion date is defined. See the prior paragraph for additional schedule information.

4. Vistra Energy's Morro Bay Project

The Morro Bay Battery Energy Storage System (BESS) is a proposed 600 MW / 2,400 MWh facility on 43 acres of the former Morro Bay Power Plant site in California. Developed by Texas-based Vistra Energy, the project aims to repurpose an inactive coastal power station into one of the largest standalone battery storage projects in the state. Once operational, it would provide enough energy to power 450,000 homes for up to four hours.

[1] Xaviour Raymond, Blackridge Research & Consulting, "Top 7 Largest Upcoming Battery Energy Storage System (BESS) Projects in the US 2025, Sep 29, 2025, https://www.blackridgeresearch.com/blog/latest-list-top-largest-biggest-bess-battery-energy-storage-system-projects-us-united-states-america

The project has faced permitting challenges at the municipal level. Initially submitted in 2020 to the City of Morro Bay, the application was paused in late 2024 after the developer opted to seek approval through the California Energy Commission (CEC). This shift followed the passage of Assembly Bill 205 (AB 205) in 2022 - a state law that allows the California Energy Commission (CEC) to certify green energy projects, bypassing local approval to accelerate development which created a streamlined permitting pathway for large-scale energy storage projects.

The facility would be constructed on a 107-acre waterfront property that still houses the iconic smokestacks of the retired Morro Bay Power Plant. By reusing industrial land, the project aligns with California's push to accelerate renewable integration while minimizing land-use conflicts. See image below.

5. NextEra Energy Resources' Roadhouse Project

The Roadhouse Energy Storage Project is a large-scale standalone BESS under development by NextEra Energy Resources (NEER) in Ontario, California. Designed with a total capacity of 600 MW / 2,400 MWh, the project is positioned to strengthen California's grid reliability while supporting renewable integration.

Half of the project's capacity, 300 MW / 1,200 MWh, has already been contracted through a utility offtake agreement at a fixed rate of USD 18.76 per kW-month. The project has also secured an interconnection agreement with the California Independent System Operator, which advances it toward construction readiness.

Roadhouse is one of NEER's most advanced storage projects in its pipeline with an estimated capital investment of US$535 million. Once operational, the facility will provide flexible, dispatchable power to meet peak demand, helping reduce reliance on fossil-fuel peaker plants.

Subject to local and state approvals, the project is scheduled to begin operations as early as June 2027

6. Bellefield BESS Phase 2

The Bellefield Solar-plus-Storage Project is one of the largest solar and battery storage projects in the United States. Acquired by AES Corporation from developer Avantus, the facility will be built in two phases, each integrating 500 MW of solar power with 500 MW / 2,000 MWh of four-hour battery storage.

Located on approximately 8,300 acres in Kern County, California, the project will connect to Southern California Edison's Windhub Substation through a 14-mile transmission line. Once fully operational, Bellefield will deliver reliable renewable energy to the California grid while supporting the state's clean energy transition.

Phase 1 already has a 15-year power purchase agreement with one of AES' corporate customers, ensuring long-term revenue stability. Alberta Investment Management Corporation, which holds a 25 percent stake in AES' growth projects, provided part of the financial backing for the acquisition.

AES will own and operate the project over the long term. Construction will also feature advanced technology, including the Maximo solar robot, which enables autonomous solar module installation to improve efficiency and reduce costs.

The AES Corporation (NYSE: AES) today (June 11, 2025) announced that it has completed construction of the 1,000 MW Bellefield 1 project, under a 15-year contract with Amazon. Bellefield is a two-phase project, with each phase including 500 MW of solar and 500 MW of four-hour battery-based energy storage, for a total of 2,000 MW of installed capacity. Once completed, the 2,000 MW Bellefield project is expected to be the largest solar-plus-storage facility in the United States.

7. Big Rock 2 Battery Energy Storage System

The Big Rock 2 Solar-and-Storage Project is a proposed renewable energy complex in Imperial County, California, combining up to 500 MW of solar capacity with 500 MW of battery energy storage. Spanning nearly 1,849 acres of privately owned land, the project is designed to enhance grid reliability while contributing to California's clean energy targets.

The Imperial County Planning and Development Services Department initiated the permitting process under the California Environmental Quality Act (CEQA) in September 2024, filing both a Notice of Preparation (NOP) and an Initial Study (IS). These documents concluded that the project may have significant environmental impacts, requiring a full Environmental Impact Report (EIR).

This project is currently being litigated, and may not move forward anytime soon.[2] If it does advance it will have a build-time I did find an article that indicated that the project would have a build-time of approximately two-years.

[2] See https://www.iid.com/Home/Components/News/News/1403/793

8. Summary

Unlike traditional power plants, battery storage does not generate electricity from fuel or natural resources. Instead, it stores electricity produced elsewhere and releases it when needed, acting as a flexible, secondary source of power. The six projects highlighted above exemplify the scale, innovation, and strategic impact of battery energy storage in the United States.

From world-record facilities like California's Darden Clean Energy Project to rapidly advancing projects such as Bellefield, these initiatives demonstrate how large-scale BESS can provide reliable, dispatchable energy, support renewable integration, and benefit local communities. As 2026 unfolds, the continued deployment of these systems will be important in shaping a cleaner, more resilient, and smarter energy grid across the nation.