California Public Utilities Commission

SAFETY AND ENFORCEMENT DIVISION FACT SHEET

2025 Battery Energy Storage System Facility Survey

July 2025

Executive Summary

California's transition to clean energy has driven rapid growth in grid-scale battery energy storage, expanding from 500 megawatts (MW) in 2019 to over 13,000 MW currently operating under the California Public Utility Commission's (CPUC) purview. To meet the state's 2045 clean energy goals (Senate Bill (SB) 100), an estimated 52,000 MW of energy storage will be needed according to the CPUC's Integrated Resource Planning Process. As this infrastructure expands, so does the importance of ensuring safety, maintenance, and operational reliability.

The CPUC's Safety and Enforcement Division (SED, website link: Battery Energy Storage Facilities in California) is responsible for ensuring the safe and reliable operation of energy storage facilities and power plants and enforces safety standards through inspections, audits, and incident investigations. In January 2025, SED conducted a statewide survey of grid-scale battery energy storage systems (BESS) to gather data on system configurations, technical properties, safety practices, emergency preparedness, and operational characteristics. The results of the survey will help shape future regulatory priorities and strategies to enhance oversight of this rapidly growing sector.

Regulatory Background

To support the growth of BESS and reduce risks, state laws SB 1383 and SB 38 directed the CPUC to set maintenance and operation standards and require emergency plans for BESS. On March 13, 2025, the CPUC adopted Resolution ESRB-13 , which requires BESS facilities to comply with safety rules specified in the General Order (GO) 167-C. The GO strengthens oversight by requiring regular maintenance, emergency preparedness, and compliance with national fire and electrical safety standards.

Purpose and Method of Survey

SED conducts surveys to better understand the configuration, safety compliance, emergency preparedness, and operational characteristics of BESS in California, with a focus on safety and reliability, and to support the development of compliance and enforcement activities.
In January 2025, SED sent a data request to energy storage system owners (ESSO) who operate BESS with 50 MW or higher capacity; 114 ESSOs responded to the survey. Facilities over 50 MW currently comprise over 85 percent of the installed BESS MWs on the electric grid. Below are key outcomes of the survey results.

Key Outcomes

All energy storage system facility survey respondents use lithium-ion battery technology.

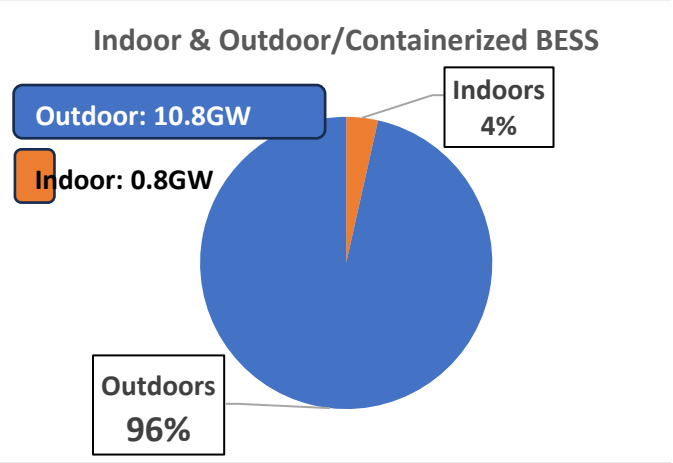

Figure 1. Available capacity for indoor and outdoor facilities of the 114 ESSOs over 50 MW in size that responded to the survey, which include indoor (4%) and 110 outdoor (96%) BESS facilities.

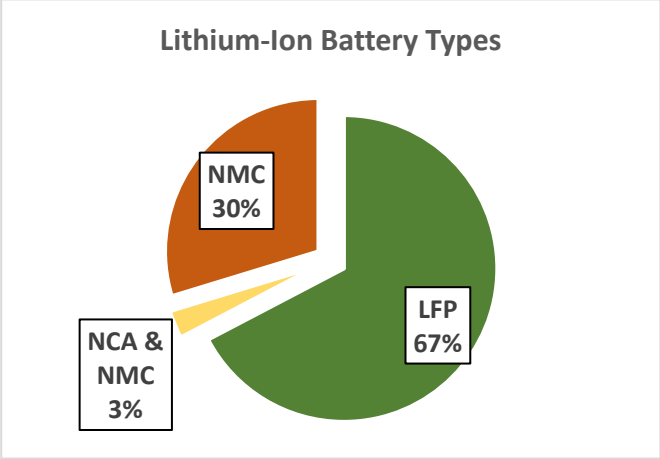

Figure 2. Available battery types of the 114 ESSOs over 50 MW in size that responded to the survey, which were all lithium-ion batteries, and of those 67% use lithium iron phosphate (LFP), 30% use lithium nickel manganese cobalt oxides (NMC), and the remaining 3% use a combination of lithium nickel cobalt aluminum oxides (NCA) and NMC.

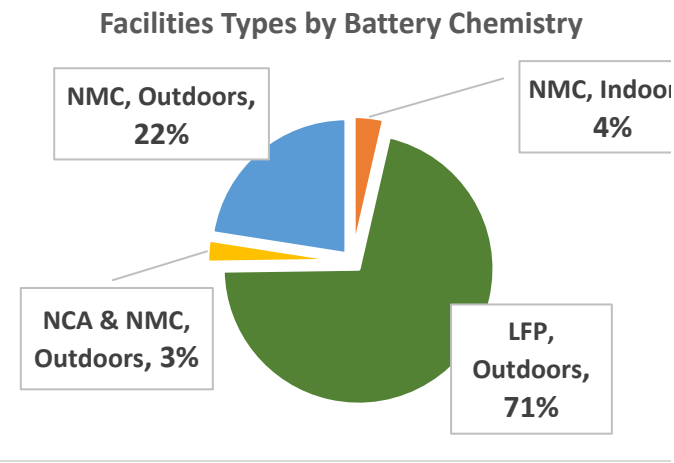

Figure 3. Available battery chemistry and installation types of the 114 ESSOs over 50 MW in size that responded to the survey, which include lithium iron phosphate (LFP) chemistry in outdoor configurations (71%), followed by outdoor NMC (22%) and indoor NMC (4%) installations. A small number (3%) use a combination of NCA and NMC chemistries outdoors.

CPUC Action

SED uses a risk-based approach considering survey responses and investigation of past incidents to prioritize audits and inspections. In fiscal year 25-26, 12 BESS audits are scheduled throughout California. Completed audit reports will be posted on SED's website. SED is also developing enforcement strategies to strengthen safety and reliability standards across the energy storage sector.