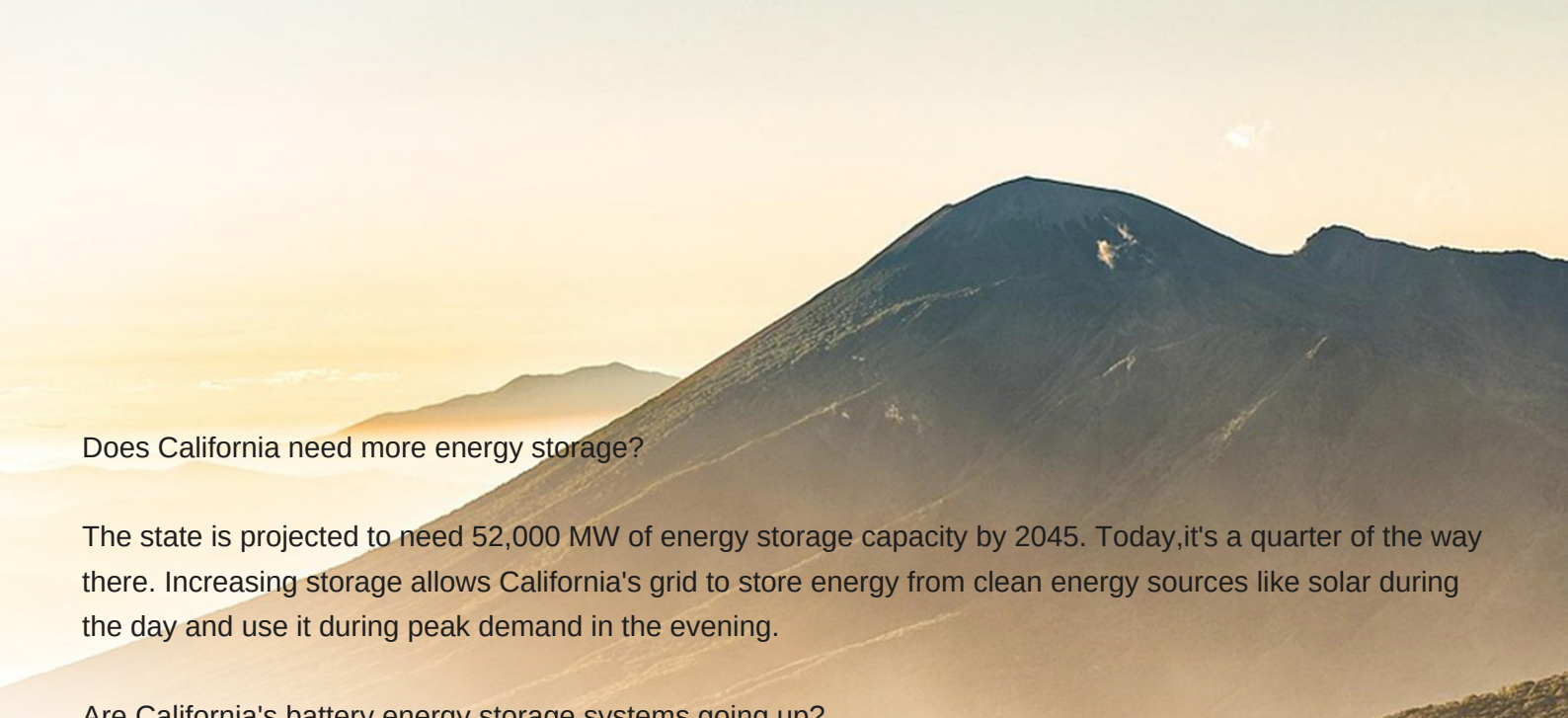


Does California need more energy storage?

The state is projected to need 52,000 MW of energy storage capacity by 2045. Today,it's a quarter of the way there. Increasing storage allows California's grid to store energy from clean energy sources like solar during the day and use it during peak demand in the evening.

Are California's battery energy storage systems going up?

For Immediate Release: October 24,2023 SACRAMENTO -- New data show California is surging forwardwith the buildout of battery energy storage systems with more than 6,600 megawatts (MW) online,enough electricity to power 6.6 million homes for up to four hours.

How many MW of energy storage capacity is needed by 2045?

The state is projected to need 52,000 MWof energy storage capacity by 2045 to meet electricity demand. "Energy storage systems are a great example of how we can harness emerging technology to help create the equitable,reliable and affordable energy grid of the future," said CEC Vice Chair Siva Gunda.

Does energy storage meet local and system capacity requirements?

R. 13-12-010: This rulemaking determined that energy storage can meet local and system capacity requirementsR. 14-08-013: This rulemaking determined that energy Storage may be included as a distribution upgrade deferral asset. R.14-10-010: This rulemaking determined that energy storage's ramping attributes can provide flexible capacity.

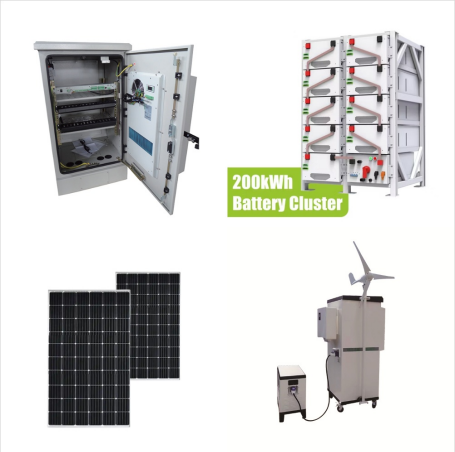
What is the long duration energy storage program?

The Long Duration Energy Storage program will pave the way for opportunities to foster a diverse portfolio of energy storage technologies that will contribute to a safe and reliable future grid. This program plays an important role in achieving California's zero carbon goals.

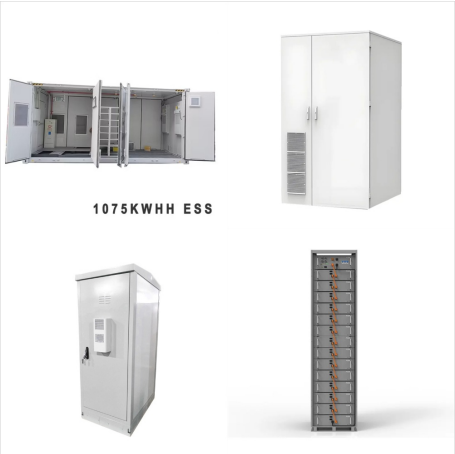
When will energy storage be available?

This procurement target was set for implementation by 2020, with installations no later than the end of 2024. D.13-10-040 also required Community Choice Aggregates (CCAs) and Energy Service Providers (ESP) to procure energy storage equal to 1 percent of their annual 2020 peak by 2020.

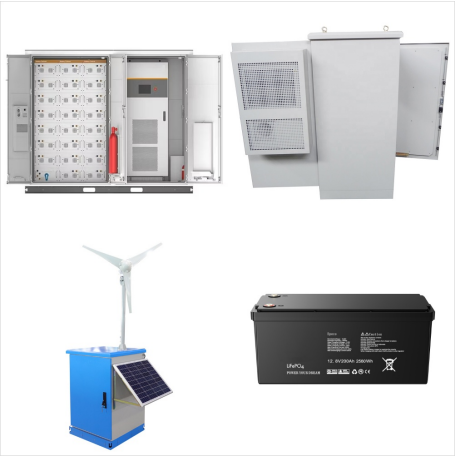
CALIFORNIA TOTAL ENERGY STORAGE MANDATE



PG& E said in a statement on Monday that it has now reached 79MW of contracted or deployed energy storage since the mandate, AB2514, was issued in 2014. (RfP) for the projects a year ago, asking for facilities of 1MW to 50MW in size each, seeking to award a total of 580MW of contracts by 2020. Elsewhere in California,

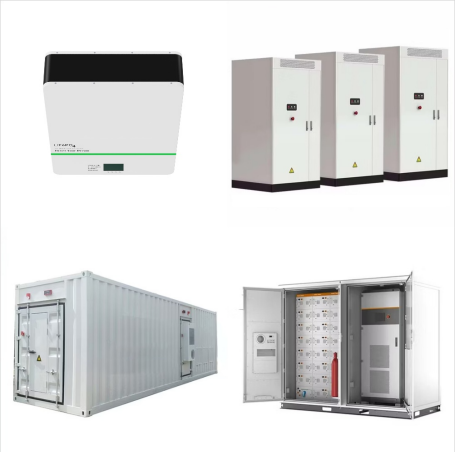


Existing mandates call for California utilities to procure nearly 1,900 MW of energy storage. share of a total of 2,000 MW of energy storage systems by Jan. 1, 2020. need for energy

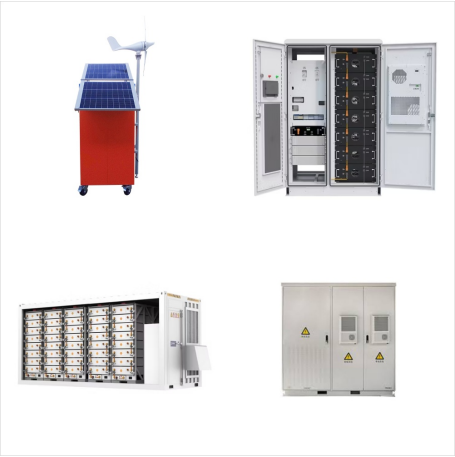


On August 8, 2023, they sought feedback on revisions to their energy storage incentive framework, specifically regarding the pros and cons of utility control over storage systems, expected costs of storage systems through 2030, and whether distributed storage resources providing grid services should opt for either front-of-the-meter or behind

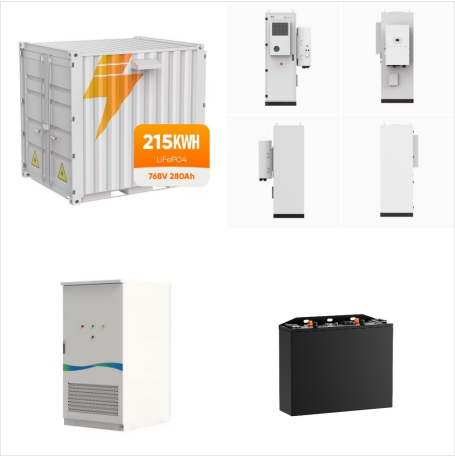
CALIFORNIA TOTAL ENERGY STORAGE MANDATE



SACRAMENTO ??? New data show California is surging forward with the buildout of battery energy storage systems with more than 6,600 megawatts (MW) online, enough electricity to power 6.6 million homes for up to four hours.

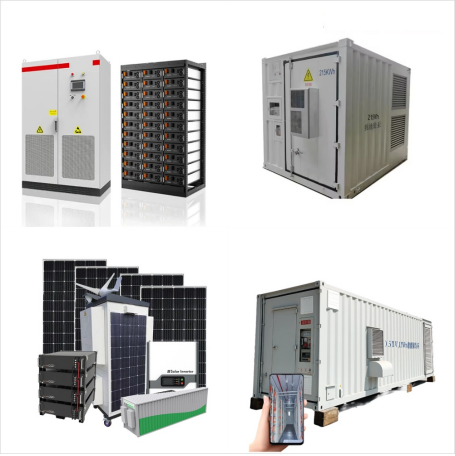


California's Energy Storage Mandate Hosted by Warren Leon, Executive Director, CESA November 19, 2013 State-Federal RPS Collaborative and ESTAP Webinar. Total Potential 160 MW >$231million 18 . Thank You! For further information related to Energy Storage Rulemaking R.10-12-007, please contact:

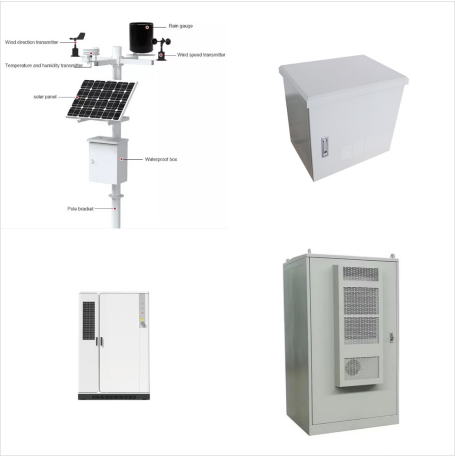


Signs of progress are emerging. From January to mid-July of this year, zero-carbon, renewable energy exceeded demand in California for 945 hours during 146 days ??? equivalent to a month-and-a-half of 100% fossil-fuel-free electricity, according to the California Energy Commission, the state agency tasked with carrying out the clean energy mandates.

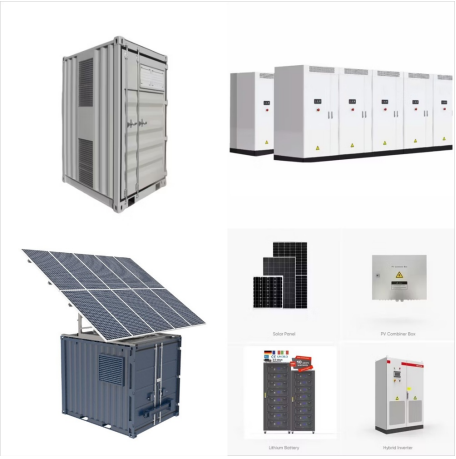
CALIFORNIA TOTAL ENERGY STORAGE MANDATE



California now has more than 10GW of battery storage, with Governor Gavin Newsom hailing "energy storage revolution," which is underway. Skip to content. Solar Media. For 2024, BNEF forecasted 4.4GW/17.4GWh of utility-scale storage to go online in California out of a total 5.2GW/19.6GWh across all scales. The firm predicted that by 2030

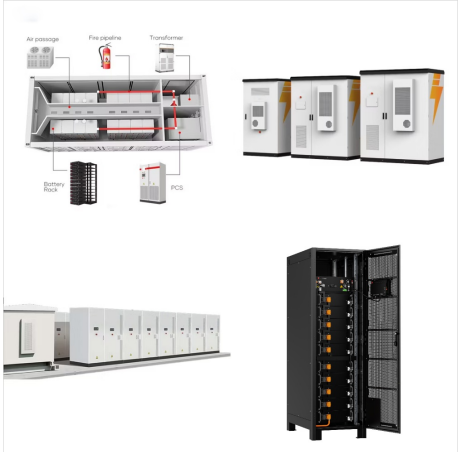


Background. The Long Duration Energy Storage (LDES) program has been allocated over $270 million to invest in demonstration and deployment of non-lithium-ion long duration energy storage technologies across California, paving the way for opportunities to foster a diverse portfolio of energy storage technologies that will contribute to a safe and reliable ???

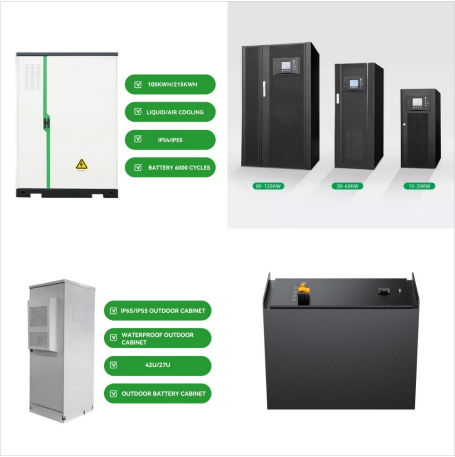


This table includes all existing state energy storage procurement mandates, targets, and goals. such as California, large pumped hydro is ineligible but small pumped hydro may be eligible. Depending on how states define, count and report their energy storage data, installed capacity listed in this table may or may not include pumped hydro

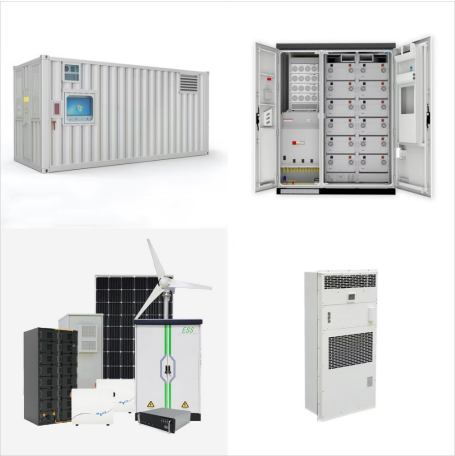
CALIFORNIA TOTAL ENERGY STORAGE MANDATE



In order to meet the 100% renewable mandate in CA, the optimal mix of renewables should be ~30% solar and 70% wind. The current situation is much different: solar comprises ~2/3 of renewable



Energy Code: Battery Storage & Electric Readiness California's Solar Mandate was updated in December of last year, and these updates went into effect in January 2023. Known as the 2022 Energy Code, this will require all ???



In 2023, the California Energy Commission (CEC) announced updates to the Title 24 solar mandate. These updates introduce new stipulations for solar photovoltaic (PV) systems, battery storage, and electric vehicle (EV) charging stations. The new laws mandate modifications to help boost renewable energy adoption in new commercial construction

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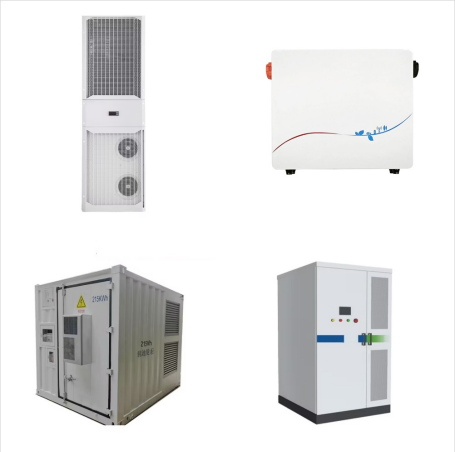
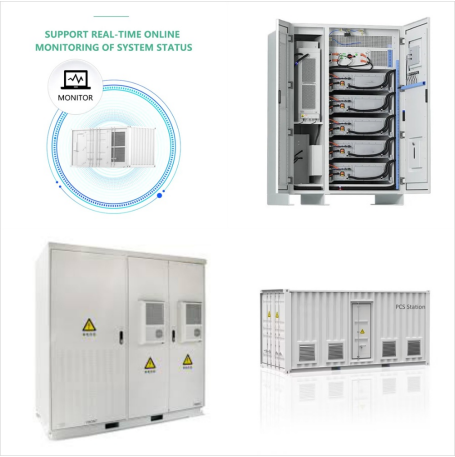
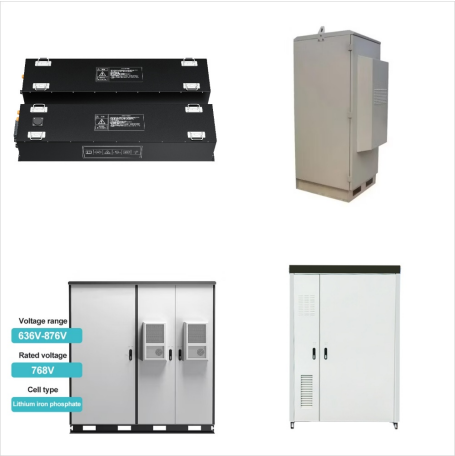


in California that collectively serve over two-thirds of total electricity demand and over three-quarters of natural gas demand throughout Panel 4, CPUC's Energy Storage Mandate Subject: Presentation by Melicia Charles, California Public Utilities Commission, at the Hydrogen Energy Storage for Grid and Transportation Services Workshop

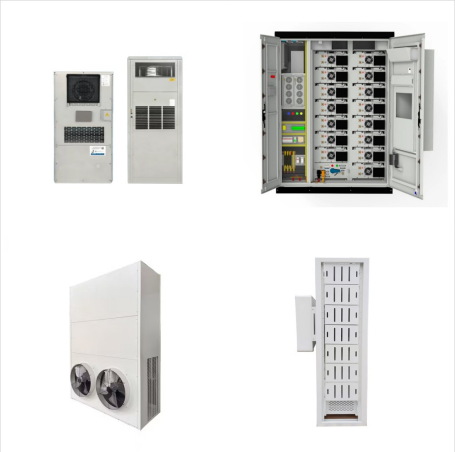


On Tuesday, the California Public Utilities Commission released a long-awaited proposal for mandating an unprecedented 1.3 gigawatts of energy storage to support the state's power grid by decade

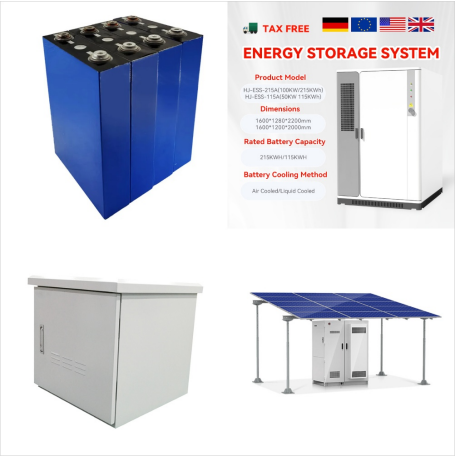


in California that collectively serve over two- thirds of total electricity demand and over three- quarters of natural gas demand throughout California. ??? The CPUC has played a key role in making California a national and international leader on a number of energy related initiatives designed to benefit consumers, protect the environment, and

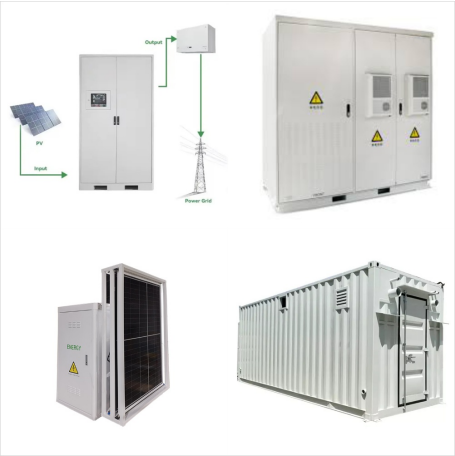
CALIFORNIA TOTAL ENERGY STORAGE MANDATE



California's AB 2514 (2010) called on the state to establish an energy storage mandate. California's Public Utility Commission accordingly approved a 1.3GW storage target for the state to be achieved by 2020. The program's progress has been guided by the ISO 's California Roadmap for Advancing and Maximizing the Value of Energy Storage Technology.

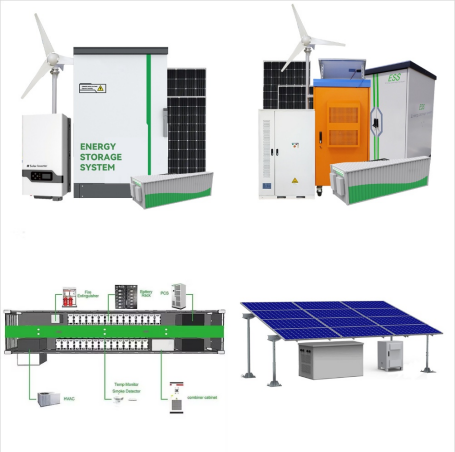


In defense of the California utility regulators, perhaps they decided to leave the details to the utilities. They have about 62 GWatt of total summer generation capacity (2005 data that was handy), so I would think that this 1.3 GWatts of storage is just one of many storage building initiatives (assuming they eventually reach 50% or more variable renewbles on the grid).

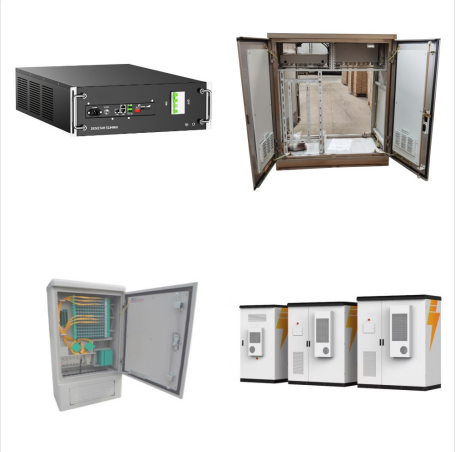


A few weeks ago California passed the United States'' first energy storage mandate. Issued by the California Public Utilities Commission (CPUC), the mandate commits all investor-owned utilities in

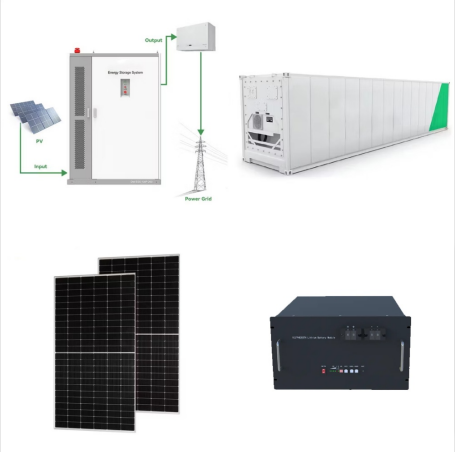
CALIFORNIA TOTAL ENERGY STORAGE MANDATE



California is facing twin challenges: Meeting renewable energy targets mandated by law, as well as dealing with some of the highest energy bills in the country. Under state law, 60% of California electricity must be generated by clean energy sources by 2030 and 100% by 2045 ??? a mandate critical to the state's efforts to combat climate change.

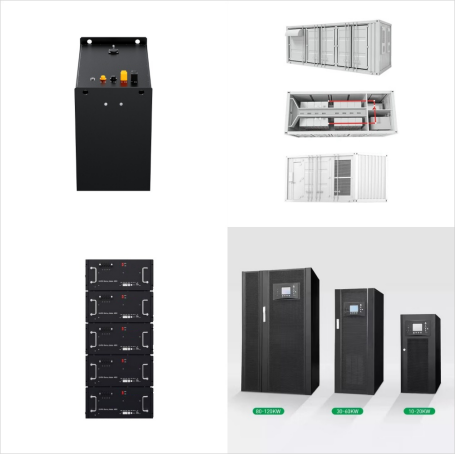


Newly constructed commercial buildings in California are now required to add solar and battery storage systems. On January 1, 2023, the California Energy Code instituted the requirement, updating the Building Energy Efficiency Standards for residential and commercial properties, as part of its push to obtain 100 percent carbon neutrality by 2045. The Energy ???

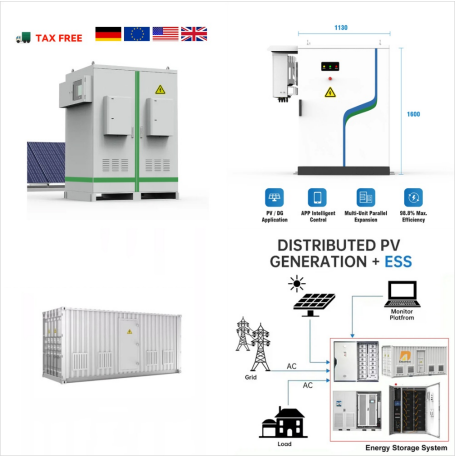


The new law gives the California Energy Commission more discretion to mandate bidirectional EV charging capabilities than a stricter version that failed last year, the independent research firm said.

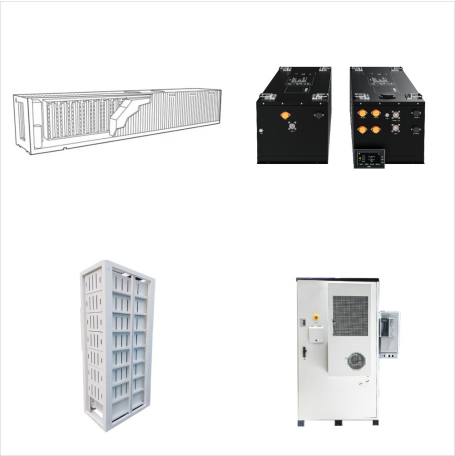
CALIFORNIA TOTAL ENERGY STORAGE MANDATE



to incentivize procurement of energy storage by California's utilities," said Commissioner Catherine J.K. Sandoval. "Storage is a game-changer that can help people manage their energy use and expand the capacity of renewable resources to provide power to homes and businesses. This decision will spur investment and innovation in energy

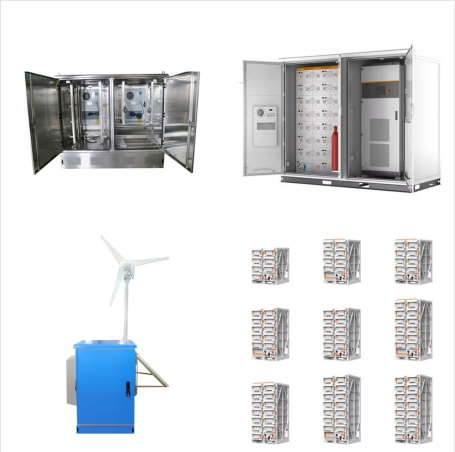


PG& E said in a statement on Monday that it has now reached 79MW of contracted or deployed energy storage since the mandate, AB2514, was issued in 2014. (RfP) for the projects a year ago, asking for facilities of 1MW ???

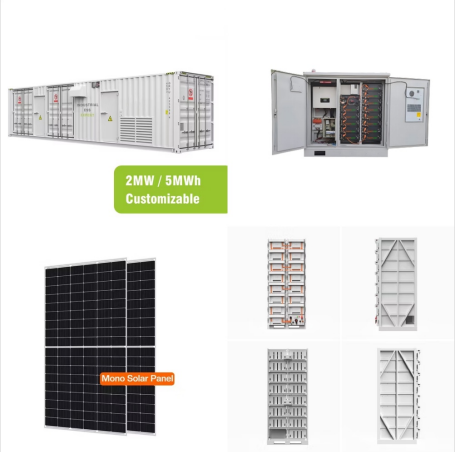


Strategic EV charging could ease the "duck curve" more than California's energy storage mandate, according to DOE researchers. state's three biggest utilities procure a total of 1.3

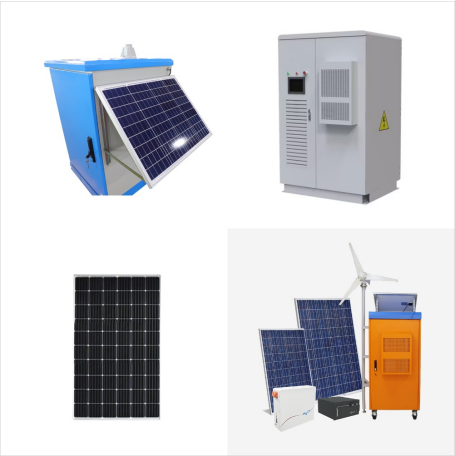
CALIFORNIA TOTAL ENERGY STORAGE MANDATE



Alex Morris, California Energy Storage Alliance . Neal Reardon, California Public Utilities Commission Energy Division . Matt Buhyoff and Kyle Olcott, Federal Energy Regulatory Commission (via Webex) 2 Overgeneration occurs when total demand is less than or equal to the sum of regulatory must-take generation, regulatory must-run generation



8 CALIFORNIA's CLEAN ENERGY TRANSITION PLAN. California's Climate and Clean Energy Goals. California has a unique opportunity to build upon the state's history of innovation, economic growth, and science-based policymaking to lead global efforts to adapt to and mitigate climate change. The state is positioned to simultaneously confront



MW of energy storage capacity is installed on the California grid today, up from 1,500 MW last summer and around 200 MW to 300 MW the summer before, Gabe Murtaugh, storage sector