

CASE STUDY

Flexible Peaking Capacity

Energy Storage
Selected to Meet
Peak Demand for
Los Angeles Area



SUMMARY

Southern California Edison recognizes the long-term economic advantages of energy storage, choosing it as a cost-effective alternative to gas peaking plants.

LOCATION

Long Beach, California, United States

The Opportunity

Fast-ramping peak power has become a necessity in California.

California's environmental objectives and rapidly changing net load profile require clean, fast-ramping peak power solutions to reduce greenhouse gas emissions and maximize the utilization of renewable energy. In the Los Angeles area, the retirement of large generation facilities has created the need to procure replacement capacity flexible enough to meet the demands of a modern, evolving grid. With the additional unexpected shutdown of the San Onofre Nuclear Generating Station in 2012, the need for new flexible capacity increased even more.

The infamous net load curve known as "The Duck Curve" illustrates that as solar resources are increasingly added to the grid, there is a risk of generating too much power during the daylight hours while not having enough firm capacity as the sun sets for the needs of people as they return home. Renewables are being curtailed in order to have enough thermal generation

online and ready to meet the steep evening ramp. Flexible fast-ramping resources must be available to address this evening peak and to enable full utilization of renewable generation.

Regional utility Southern California Edison issued an all source RFP for replacement peaking capacity in the Los Angeles basin area. Transmission constraints created the additional challenge that systems be placed near the load centers they would serve¹. Between 2013 and 2014, Southern California Edison evaluated more than 1,000 responses. The proposals included a wide variety of technologies, including large-scale combined cycle, simple cycle gas turbines, demand response and energy storage. After extensive evaluation of each proposal on a long-term economic market model, Southern California Edison selected energy storage as one of the most viable solutions to meet its peak load needs.

The Solution

Energy storage is selected as a cost-effective solution for meeting peak power demand.

Southern California Edison selected the Advancion energy storage platform to provide on-demand capacity for Los Angeles's peak loads. The 100 MW lithium-ion energy storage facility will serve as a peaking plant that will provide both the ability to charge during off-peak periods and discharge for up to four hours, in combination with providing much-needed grid stabilizing services. Energy storage has a small footprint and could be sited in the densely populated Los Angeles area. The battery system will augment the natural gas power plant at the Alamos Energy Center in Long Beach.

The decision to implement an energy storage solution in such a competitive environment affirms the long-term cost efficiency of energy storage. Southern California Edison's procurement of energy storage came in far ahead of the timeline set by the California Public Utilities Commission^{2,3}, making it clear that the economic benefits, even more than the regulatory requirements, are the driving factor for implementing grid storage. Southern California Edison's economic models determined that between 400 and 900 MW of energy storage was the optimal resource for its grid; the Alamos deployment was sized at 100 MW and is one of the world's largest contracted lithium-ion energy storage project to date.

The Alamos implementation of Fluence energy storage has been approved and is in an advanced stage of system integration, with a target operating date of late 2020. The system will provide peaking demand and enhance grid stability through at least 2040.

System Capabilities

The system at Alamos will provide 100 MW of grid-connected energy storage for immediate response to demand peaks at any time of day. The system can also absorb excess overgeneration when needed.

The system is dispatchable within seconds using Fluence's proprietary market-responsive control algorithms, to improve overall power quality at the point of interconnection. This frees up nearby regional power plants to operate closer to full capacity and at more efficient output rates, rather than keeping capacity in reserve for regulation.

Conclusion

The experience gained in planning this large-scale project enabled lithium-ion energy storage to be considered as viable a solution for the Aliso Canyon energy deficit⁴, where seasonal undersupply of natural gas might otherwise have caused rolling blackouts⁵. Even at scales of 150 MW or more, a Fluence energy storage solution can be deployed in a matter of months, compared with years for traditional generating stations.

Fluence's energy storage platforms are the leading alternative to traditional peaking facilities and are being deployed at numerous sites worldwide. Fluence's storage platforms require no fuel or water and are emissions-free. The small land footprint required for storage means that systems can be easily placed in dense urban areas near the load pocket and can be built in a fraction of the time of traditional generating facilities. As a result, site permitting is simple and efficient.

Energy storage is a unique asset for the grid that enhances overall flexibility, reliability, and capacity value. Storage reduces emissions by substituting for traditional peaking plants and by improving the utilization of renewable resources. It can be forward-deployed to cut transmission losses, while its load-shifting capability and instant availability serve to reduce out-of-merit dispatch, start-up costs for traditional peaking plants, and overall peak energy costs. For these reasons, advanced energy storage technology is the best solution for providing flexible peaking capacity.

1. <http://docs.cpuc.ca.gov/publisheddocs/published/g000/m089/k008/89008104.pdf>
2. <https://www.greentechmedia.com/articles/read/california-sets-1-3gw-energy-storage-target-by-2020>
3. <http://www.powermag.com/sce-signs-contracts-for-record-amount-of-energy-storage/>
4. <http://www.latimes.com/business/la-fi-electricity-storage-20160526-snap-story.html>
5. <https://www.pe.com/2016/04/05/energy-california-faces-blackouts-after-historic-gas-leak-update>



About Fluence™

Fluence, a Siemens and AES company, is the leading global energy storage technology solutions and services company that combines the agility of a technology company with the expertise, vision, and financial backing of two industry powerhouses. Building on the pioneering work of AES Energy Storage and Siemens energy storage, Fluence's goal is to create a more sustainable future by transforming the way we power our world. Fluence offers proven energy storage technology solutions designed to address the diverse needs and challenges of customers in a rapidly transforming energy landscape, providing design, delivery, and integration in over 160 countries.