



PERFORMANCE OPTIMISATION & INCREASED VALUE STREAMS IN THE CAISO MARKET

Largest energy storage deployment tied to a renewable resource in western USA

Wärtsilä has delivered an energy storage system to a renewable developer in the western United States. The 70 MW storage system is a first grid-scale storage project and enables optimised market participation in the California Independent System Operator (CAISO) energy and ancillary services market. The order was placed with Wärtsilä in late 2019 and the project commissioning was completed less than a year later in summer 2020.

The project includes Wärtsilä's containerised **GridSolv Max** solution and **GEMS** advanced energy management technology. The storage system is co-located with existing renewables in California and is Wärtsilä's largest energy storage deployment tied to a renewable resource in the western U.S. This adds to Wärtsilä's portfolio of 20+ operating energy storage projects in North America.

GEMS integrates the existing renewables and connects the site to the California energy market. The goal of the storage system is to integrate energy assets and maximise revenue and return on investment by optimising energy and ancillary service sales in the California market. In addition, GEMS enables the customer to purchase electricity from the market when prices are low and sell stored energy back into the market when energy prices are high.

Long-term storage benefits

System safety was a key consideration for the project, including battery chemistry. Advances in battery technologies have placed lithium iron phosphate chemistry at the forefront when selecting the best power source for high energy use devices that are portable. Wärtsilä is incorporating lithium iron phosphate batteries as the best fit for this project, enhancing safety measures of the site.

Lithium iron phosphate has a number of characteristics that make it a safe and secure battery technology. First, it is a strong chemical stability, meaning the battery stays cool in higher temperatures and the speed at which heat is released is slower than other chemistries. Second, an important consideration is selecting a battery chemistry that does not lose its charge over long periods of time. Lithium iron phosphate batteries are typically adopted in storage systems and applications requiring longevity, as they can run for prolonged lengths of time—and maintain constant power throughout—before needing to be charged. A third safety advantage of lithium iron phosphate includes the ease of recycling of the battery after use or failure. The chemistry is nontoxic and can be disposed of relatively easily.



THE CHALLENGE	WÄRTSILÄ'S SOLUTION	BENEFIT
<ul style="list-style-type: none"> • Enable the user to support a cost-effective, safe and dependable energy system, and provide CAISO market participation. • Optimise a renewable resource co-located with a storage system. 	<ul style="list-style-type: none"> • The unique pairing of smart storage software (GEMS) and hardware technology integrated with renewables results in the simultaneous optimisation of multiple generation assets. • GEMS connects the site to the California energy market, maximising revenue and return on investment by optimising energy and ancillary service sales. In particular, the system provides ancillary services and facilitates energy arbitrage; purchasing electricity from the market when prices are low and selling stored energy back into the market when short-term costs rise. 	<ul style="list-style-type: none"> • Sustainable and cost-effective infrastructure that is responsive to the energy demands of the local grid. The storage system provides the needed flexibility and reliability to support renewables, while the versatility of GEMS to manage and operate various assets needed in the energy market also ensures the future-proofing of the assets. • Improved and optimised market participation in the CAISO energy and ancillary services market.

Flexible added capacity

The integrated energy storage solution is responding to a demand for generation resources that provide additional versatility to optimise the operation of renewables into the local grid. The addition of an energy storage solution in the CAISO market represents a progressive, but also a sustainable and cost-effective solution. Wärtsilä understands the role of different technologies as part of our customer's power systems, and the flexible combination of generation assets in this project enable a considerable contribution to and optimised participation in a key global energy market.

SITE SIZE: 70 MW

SITE LOCATION: Western USA

APPLICATIONS: Renewables+ (renewables integration), Ancillary services, Energy arbitrage

SCOPE OF SERVICES: Engineered equipment delivery (EEQ)

DELIVERY: 2020

RELATED RESOURCES

[Wärtsilä is delivering a 70 MW energy storage system in California to optimise renewable energy system performance and maximise ROI](#)

[GEMS energy management technology](#)

[California ISO](#)



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