



Supporting the clean energy transition in California and Hawaii, USA

Wärtsilä Energy Storage & Optimisation teamed up with Clearway Energy Group to optimise some of the largest solar+energy storage facilities in the world

The Story

California and Hawaii are leading the energy transition in the United States. As the two states increase their mix of renewable energy generation to further their aggressive carbon reduction goals, the need for energy storage technologies is paramount to the health and sustainability of their respective electric grids.

To provide essential grid reliability in these markets, Wärtsilä Energy Storage & Optimisation (ES&O) is providing a **497 MW / 2 GWh portfolio of five energy storage systems** to Clearway Energy Group (CEG), one of the largest developers and operators of clean energy in the U.S. The projects are in Hawaii and California and are coupled with solar photovoltaic (PV) resources at each site. The projects make up some of the largest co-located and hybrid energy storage projects in the country.

A clean energy future in California

In 2018, California passed Senate Bill 100, which requires renewable energy and zero-carbon resources to supply 100% of the state's electricity by 2045. Stabilising grid conditions within the region with energy storage is instrumental as California continues to decarbonise its electric grid.

Wärtsilä ES&O is supplying a total of 422 MW / 1.7 GWh of energy storage for three of CEG's solar facilities in Southern California. In San Bernardino County, the Daggett projects feed 482 MW of solar to a 275 MW / 1.1 GWh energy storage system. In Kern County, Wärtsilä ES&O will connect a 147 MW / 588 MWh energy storage system to the operating 192 MW Rosamond Central solar facility.

The energy storage projects ensure long-term favourable outcomes for CEG's solar facilities and provide additional flexibility to the local grid by enabling renewable energy distribution during volatile peak periods. The Daggett projects created more than 500 union jobs during construction and will sustain at least a dozen operations, maintenance, and management jobs on site.

"We're pleased to partner with Clearway Energy Group on this expansive portfolio of solar-plus-storage projects in California and Hawaii. Energy storage is vital to achieving a 100% renewable energy future, and these projects underscore Wärtsilä ES&O's leadership in providing flexible solutions to aid in the energy transition."

*Andrew Tang,
Vice President of Energy Storage & Optimisation, Wärtsilä*

The Challenge	Wärtsilä ES&O's Solution	The Benefits
<ul style="list-style-type: none"> Help meet clean energy targets in California and Hawaii. Provide additional reliability to the local grids that are impacted by high levels of intermittent renewable energy sources. Provide flexibility to the local grid during peak demand periods and by extending the solar plant output as solar generation tapers off and to. 	<ul style="list-style-type: none"> 497 MW / 2 GWh of energy storage projects—including Quantum systems and GEMS Digital Energy Platform—integrated with five of CEG's solar facilities in California and Hawaii. Using the GEMS platform and plant PPC, in conjunction with HECO and CAISO day-ahead markets, to provide ancillary services, resource adequacy, and bulk power supply. Service+ GAP solution ensures that all the energy storage systems within the portfolio for CEG perform optimally and on guaranteed levels. 	<ul style="list-style-type: none"> Provide stability to the Californian and Hawaiian energy markets while allowing the states to continue to integrate renewable energy assets. Generate \$18.5M in taxes to benefit local California schools, hospitals, and additional public infrastructure, while creating more than 500 union labor construction jobs. Reduce energy costs for Hawaiian residents by providing more affordable energy options and reducing reliance on imported fossil fuels.

The projects will generate \$18.5 million in local tax revenue and \$5 million in spending annually during operations, benefitting local schools, hospitals, and additional public infrastructure.

The Daggett 2 and 3 projects were completed in October 2023. The Rosamond Central project reached commercial operation in 2024.

With California's aggressive decarbonisation targets, energy storage is more than necessary. In order to meet its 2045 goal of net-zero emissions, the state will need to deploy 40 GW of energy storage, according to a study by San Diego Gas & Electric (SDG&E).

Wärtsilä ES&O is committed to helping California meet its climate targets.

Decarbonising Hawaii

In 2015, Hawaii became the first state to mandate 100% renewable energy by 2045. The state also aims to transition to clean energy to reduce its reliance on costly imported fossil fuels.

Wärtsilä ES&O delivered 75 MW / 300 MWh of energy storage for two of CEG's solar facilities in Oahu, Mililani I Solar and Waiawa Solar, totalling 75 MW of PV. The Mililani I 39 MW solar facility is paired with a 39 MW / 156 MWh storage system, while the 36 MW Waiawa solar facility is coupled with a 36 MW / 144 MWh energy storage system.

The energy storage projects in Hawaii help CEG ensure reliable delivery of sustainable energy and contribute to

the state's carbon reduction targets. Due to the state's reliance on energy imports, Hawaii residents pay twice the rate of any other state in the U.S. for their electricity. Increased clean energy investments help reduce cost pressure for utility customers.

The Mililani I project was completed in August 2022 and the Waiawa project was completed in January 2023. These hybrid battery projects are Wärtsilä ES&O's first large-scale energy storage systems in Hawaii.

Backed by the best

Each facility includes Wärtsilä ES&O's Quantum, a fully integrated, modular, and compact energy storage system. They also include GEMS Digital Energy Platform, Wärtsilä ES&O's sophisticated energy management system. Four projects include 10-year service agreements and one includes a five-year service agreement, guaranteeing capacity, maintenance, and performance for the lifecycle of the system.

Ushering in the future of co-located carbon-free energy in California

For the U.S. to meet its climate goals, the country will need to install a total of 100 GW of energy storage by 2030. Over the next several years, most planned energy storage projects will be co-located with solar generation. These co-located systems in California illustrate Wärtsilä ES&O's position as a recognized leader in clean energy solutions.

Site sizes:

Daggett 2: 131 MW / 524 MWh

Daggett 3: 144 MW / 576 MWh

Rosamond Central: 147 MW / 588 MWh

Mililani I: 39 MW / 156 MWh

Waiawa: 36 MW / 144 MWh

Site locations:

Daggett 2 & 3: San Bernardino County, California

Rosamond Central: Kern County, California

Mililani I & Waiawa: Oahu, Hawaii

Solution:

Renewables+

Scope of services:

Engineering equipment delivery (EEQ), Service+ GAP

Delivery:

2022–2024

Related Resources

[Press Release](#)

[Quantum](#)

[GEMS Digital Energy Platform](#)

[Video: Hawai'i's Transition to 100% Clean Energy](#)

[Video: Welcome to Daggett Solar + Storage in CA](#)



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