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A new microgrid in California, at the nation's second-busiest seaport, takes an innovative approach to providing reliable, resilient, and sustainable power, providing a glimpse at the future of such installations at commercial and industrial sites.

The Port of Long Beach (POLB) is among the busiest seaports in the U.S. It's among the top 10 in terms of annual cargo volume in North America, and the second-busiest container seaport in the nation, handling more than 8 million container units in 2018, the most-active year in its history.

The port is an organization that considers itself "a trailblazer in innovative goods movement, safety, environmental stewardship and sustainability." That's no small task. The port sits on 3,200 acres, with 31 miles of waterfront. It has 10 piers, 62 berths, and 68 post-Panamax gantry cranes. Its annual trade is valued at more than \$200 billion, and it supports more than 575,000 jobs in Southern California.

The port's five-member Board of Harbor Commissioners, along with executive director Mario Cordero, is pushing Long Beach toward a cleaner energy future. This decade, the Port has pursued a \$4 billion capital improvement program to accommodate larger ships, create more jobs, and make the site one of the world's most-sustainable marine facilities.

"Ensuring a stable supply of energy is crucial to the zero-emissions future the Harbor Commission envisions for the Port of Long Beach," said Tracy Egoscue, president of the Long Beach Board of Harbor Commissioners, in a statement last year when the design, engineering, and construction contract for the new microgrid project was awarded to Schneider Electric.

When the California Energy Commission (CEC) provided a \$5 million grant to POLB, Houston and the City of Long Beach Harbor Department wanted to ensure it was well-spent. The new microgrid is designed to increase energy resilience through islanding and distributed energy resource (DER) integration, a system that will allow the port's critical safety and security facility to operate without interruption.

The goal of the CEC's grant, which comes from California's Electric Program Investment Charge (EPIC) fund, was to accelerate development and commercialization of microgrids, as a way to isolate from the power grid and improve participation in utility demand response programs, helping balance energy demand during peak periods.

Schneider Electric's \$5.2 million contract with POLB is part of a \$7.2 million project partly funded by the CEC grant. It includes a solar carport, energy storage systems, and advanced system management controls at the port's security headquarters, the Joint Command and Control Center, a site that is used for all critical safety and surveillance functions, as well as the incident command center during emergencies and



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natural disasters. It's a complex project worthy of POWER's Commercial & Industrial Generation award.

"We are spending \$5 million of someone else's money," said Houston, noting the EPIC fund is supported by a charge on California power customers' bills, "so we have to demonstrate that it goes to the benefit of California ratepayers."

Mark Feasel, vice president for the electric utility segment and smart grid for Schneider Electric, told POWER, "We've certainly done a lot of work at seaports around the world. Most of it is ship-to-shore power, facilitating the shutdown of the ship's auxiliary engines so they're not coming in and burning fuels at berth."

Feasel said the project presented an opportunity to design a complex microgrid offering modularity and flexibility. The project includes using students from the University of California, Irvine's Advanced Power and Energy Program to compile and analyze 12 months of performance data, making it available to other seaports in the state.

Feasel also said "working with a sophisticated partner in the project" was key to its success. "The port is very much an organization with a deep competence in complicated systems and projects. It was a no-brainer for us to take it on," he said. "We were investing a lot of resources, they were investing a lot of resources. It was never a question about working with them."

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