



Figure 1: Map of KCT and the Surrounding Area

Summary

The Kapalapa Container Terminal Gaining Regenerative and Efficient Energy Needs (KCT-GREEN) Project will supplement development of the \$600-million Kapalapa Container Terminal (KCT) in Honolulu, HI; increase the efficiency, safety, and reliability of goods movement to and from the Hawaiian Islands; reduce the emissions and environmental impacts of port cargo handling operations; establish a truly resilient microgrid-enabled port terminal hub in Hawaii; and develop a replicable strategy for transitioning the terminal to resilient zero-emission and electric technologies. Importantly, the proposed cargo handling equipment, security systems, renewable energy microgrid, terminal and gate infrastructure, facility planning, and port sustainability planning investments proposed for the project will support each of the objectives of the Port Infrastructure Development Program (PIDP).¹

Project Need

The Port of Honolulu is a naturally resilient coastal seaport, but it remains vulnerable to Hawaii's reliance on fossil fuels, increasing threats from frequent extreme weather events, high costs of energy, and dependence on imported goods. In furtherance of facility operations at KCT, the Hawaii Department of Transportation—Harbors Division (HDOT Harbors) has partnered with Hawaii Stevedores, Inc. (HSI), a subsidiary of The Pasha Group (Pasha), to supplement the development of KCT.

KCT-GREEN will increase port resiliency and capacity, promote energy independence, reduce carbon emissions, support workforce development, increase equity and opportunity, and mitigate disruptions to supply chains, inclusive of Marine Highway 1 (M-H1). The proposed project will deploy conventional and zero-emission (ZE) container handling equipment (CHE), new gate and security technologies, and a large-scale renewable energy microgrid system.

KCT will serve as an essential trade gateway for international and domestic goods movement. The 84-acre terminal will move more than 200,000 full twenty-foot-equivalent units (TEU) annually. With the KCT-GREEN project, KCT will utilize highly efficient gate systems and internal queuing to reduce local traffic. The new cargo yard will allow approximately 50,000 truckloads per year to move directly within the terminal facilities, removing these trucks from the adjacent highway system and reducing traffic congestion. Landside construction of KCT was completed in 2021, and waterside construction commenced Spring 2021 with completion planned for 2024. KCT-GREEN will address Phase III activities related to building resiliency, increasing safety and efficiency, and accomplishing ZE goals.

The maritime services that Honolulu Harbor provides are crucial to the State's population as about 85 percent of goods we use in Hawaii are imported, and 91 percent of those imports comes through the State's commercial harbors system.² Building this cargo terminal will ensure that goods will be delivered in a more efficient, cost-effective manner through the State's commercial harbor facilities, reducing potential disruptions caused by natural disasters. KCT-GREEN will also eliminate the two-mile dray for inter-island barge services by installing new and upgraded automated gate systems and utilizing on-dock barge transloading through the adjacent Young Brothers terminal.

¹ <https://www.maritime.dot.gov/PIDPgrants>

² https://hidot.hawaii.gov/harbors/files/2023/01/VOL-I_HHMP-2050.pdf

Scope

The project comprises four components, each with independent utility: 1) Operations and infrastructure improvements; 2) Smart gate and security technology to improve operations efficiency and safety; 3) Deployment of a resilient, long-duration microgrid powered by micro-wind and solar energy generation systems; and 4) Development of a Facility Resiliency Plan and Terminal Electrification Plan.

Schedule

The project was awarded funding in Fall 2022 with a targeted project completion date of Fall 2025. Workforce development and training will occur throughout the entirety of the project. The community and stakeholder outreach plan will be completed in 2023, with a final report expected in 2025. Planning and permitting will commence in Spring 2023, and procurement of components will begin in Summer 2023. Following contractor selection in Spring 2023, construction will be completed by 2025. The Operations Measurement & Verification Plan will be completed in Spring 2025, with a final report expected in Fall 2025. The final versions of proposed plans for planning grant activities will be complete in Spring 2025, and technology transfer activities and reporting will occur through Fall 2025.

Budget

The estimated budget for the KCT-GREEN Project is \$139,361,500, which accounts for some 22% of the total forecasted \$625,000,000+ cost of developing the new Kapalama Container Terminal. The KCT-GREEN Project was awarded \$47,326,300 from the FY2022 PIDP, representing 33.96% of eligible projects costs. The remaining \$92,035,200 (66.04%) of eligible KCT-GREEN costs will be covered by HSI and Pasha with the potential to secure additional public funding to further enhance this new terminal.

Benefits

The operations and infrastructure improvements, smart gate and security technologies, solar- and wind- powered microgrid, and Facility Resilience Plan and Terminal Electrification Plan will all address safety, efficiency, and reliability at KCT. KCT-GREEN will improve the loading and unloading of goods at the port by upgrading crane operations to five grid-tied electric cranes, leading to an immediate and quantitative reduction in air pollution, noise pollution, and energy costs while also increasing operational capacity. The self-sufficient solar, wind, and recaptured energy-backed microgrid and battery storage system will increase port resiliency against inclement weather, man-made disasters, and rolling blackouts. A modern and highly automated gate system will exponentially increase the safety of cargo, reduce public street congestion, reduce the risk of serious accidents, and increase cargo throughput capabilities.

Improvements to the safety of goods movement include increased space that will allow wheeled container movement and the elimination of infrastructure fail points to ensure that operations will continue during extreme events and severe weather. Improvements to the reliability of goods movement include increased crane productivity, the elimination of redundancy in loading and offloading cargo, and greater energy independence and resiliency. A few highlights of quantitative improvements include a 30% increase in annual cargo handling capacity, repair to the highway system that will save an estimated \$1.7M in pavement damage, and substantial fuel cost savings. KCT-GREEN's Benefit-Cost ratio is 2.7, meaning there will be \$2.70 of societal benefit generated for every federal dollar invested in the project. The project will enable KCT to provide better quality container handling service than the Sand Island Terminal and save resources over the 20-year study period, which represents only a portion of the KCT lifespan. Overall, KCT-GREEN will improve operational efficiency, address growth constraints, improve the terminal yard layout, and increase the speed of cargo movement while achieving significant energy cost saving.