



Hawai'i Natural Energy Institute Research Highlights

International Support

Energy Regulatory and Technical Support for Palau

OBJECTIVE AND SIGNIFICANCE: Through support from the Office of Naval Research (ONR), HNEI providing technical, regulatory, and policy assistance to the Republic of Palau. HNEI's Grid**START** continues to support the Palau Energy and Water Administration (PEWA) and the Palau Public Utilities Corporation (PPUC) in advancing the country's energy transition, focusing on system planning, grid operations, and interconnection requirements critical for increased integration of very high levels of locally available, but intermittent and variable energy resources.

BACKGROUND: In 2022, Palau set a national goal to secure 100% of its energy needs through locally available alternative energy resources by 2050. Achieving this target depends on securing financing for major alternative energy initiatives and deploying systems capable of managing intermittent and variable energy resources. A 15.3 MW solar photovoltaic (PV) plus 12.9 MWh battery energy storage system (BESS) commissioned in 2023 through foreign direct investment became the largest of its kind in the Western Pacific region. Additional utility-scale BESS and distributed rooftop PV installations are under development, accelerating the nation's energy transition efforts while increasing its operational and regulatory complexity.



Figure 1. PV arrays at Palau's SPEC PV+BESS plant.

PROJECT STATUS/RESULTS: By the end of 2024, HNEI had completed extensive capacity building, power system analyses and regulatory support for PEWA and PPUC. Work included drafting a new national grid code, conducting multiple training sessions in Palau and Hawai'i and performing preliminary grid modeling to assess the impacts of inverter-based resources (IBRs).

In early 2025, the team applied advanced production cost modeling (PCM) using the SAInt software platform to analyze system-wide generation dispatch, BESS investment strategies, and operational cost impacts across Palau's thermal and distributed resources. The modeling identified options to

improve system flexibility through optimized storage operation.

Concurrently, HNEI also launched a PV hosting capacity (HC) study for Palau's distribution network. The "Airport Feeder" was selected as the pilot circuit following a field survey with PPUC personnel to map transformers, feeders, wire sizes and customer-sited rooftop PV systems. Using the collected data, Grid**START** constructed a detailed power flow model of the feeder in PowerFactory, integrating in-house stochastic analysis algorithms to evaluate distribution-level connection limits.



Figure 2. Grid**START** and PPUC personnel conducting a field survey of transformers.

We also initiated development of a "User's Handbook" to assist the PPUC in implementing the newly adopted grid code and establishing online procedures for streamlined PV interconnection review. The handbook was nearing completion when portions of ONR funding concluded, which also precluded planned training on advanced system planning tools and data analytics. The analytical work completed to that point using the SAInt and PowerFactory platforms nonetheless created a durable technical foundation to guide future grid modernization and capacity-building efforts in Palau. Throughout 2025, coordinating with key partners, including the Asian Development Bank, Japan International Cooperation Agency, Okinawa Enetech and Tokyo Electric Power Company, HNEI ensured that technical assistance remained aligned with Palau's national energy priorities. While ONR support concluded in 2025, HNEI plans to maintain collaboration with Palau as resources permit under future funding opportunities.

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