Hawai‘i Natural Energy Institute Research Highlights

International Support

Renewable Energy Regulatory and Technical Support for Palau

OBJECTIVE AND SIGNIFICANCE: Under funding of the Asia Pacific Regional Energy System Assessment (APRESA) grant from the Office of Naval Research, HNEI's Grid System Technologies Advanced Research Team (Grid*START*) is providing technical and regulatory/policy support to the Republic of Palau. Particularly, HNEI is supporting Palau's Energy and Water Administration (PEWA) and Public Utilities Corporation (PPUC) in implementing the country's clean energy transition.

BACKGROUND: In 2022, Palau increased its renewable energy (RE) target from 20% by 2020 to 100% by 2050. The ability to secure financing for major RE projects from international funding sources is key to enabling the achievement of Palau's ambitious RE goals. For example, in 2023, a new 15.3 MW solar photovoltaic (PV) and 12.9 MWh battery energy storage system (BESS) project in Palau funded by foreign direct investment became the largest of its kind in the Western Pacific region.

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

Additional RE projects are already underway or being planned, including additional utility-scale BESS and substantial customer-sited rooftop PV rollouts. This unprecedented and increasing penetration of inverter-based resources (IBRs) on the PPUC power grid has given rise to significant technical and regulatory challenges in the areas of grid integration and operations, as well as rooftop PV program/tariff design.

PROJECT STATUS/RESULTS: In September 2023, at PEWA's request, HNEI hosted a three-day training program in Honolulu for PEWA and PPUC staff on issues relevant to Palau's energy transition. Discussions on further support to Palau continued through October 2023, when at PEWA's request, Grid*START* performed a high-level technical and financial analysis of PPUC's grid operations with both existing and planned utility-scale and customer-sited PV generation, including projected levels of future excess energy curtailment and energy shifting (i.e., BESS) needs. In February 2024, we developed and delivered a new grid code for Palau, which includes updated requirements for the interconnection of IBRs and has been adopted by PEWA. In June 2024, Grid*START* conducted a three-day in-person training at PPUC's offices in Koror for PPUC and PEWA staff on a range of RE integration topics.

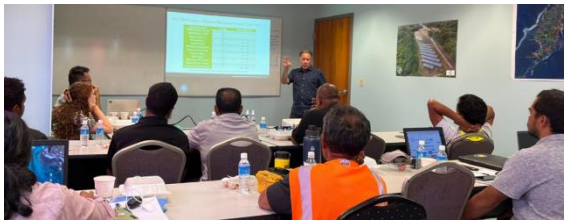

Figure 2. Renewable energy capacity building at PPUC.

In October 2024, HNEI delivered in-person training in Koror on the newly adopted Palau grid code, including streamlined/online application and review processes for distributed rooftop PV interconnections. The team remains actively engaged in the following technical and regulatory support to PEWA and PPUC:

- Developing a "User's Handbook" to assist the PPUC in its use of the newly adopted grid code and streamlined/online application and review processes for rooftop PV interconnections;
- Designing new programs/tariffs for customer-sited PV/BESS systems;
- Hosting capacity analysis to integrate more RE, including building new models of the PPUC grid using DIgSILENT and SAint software; and
- Capacity building on system planning methods, including training on various grid modeling tools.

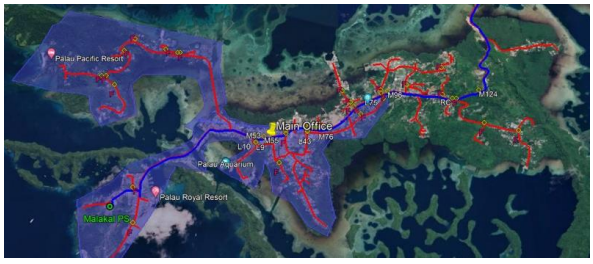

Figure 3. Distribution feeders on Malakal Island, Palau.

Funding Source: Office of Naval Research

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