



Hawai'i Natural Energy Institute Research Highlights

International Support

Papua New Guinea Electrification Partnership (PEP) Activity

OBJECTIVE AND SIGNIFICANCE: HNEI's Grid System Technologies Advanced Research Team (GridSTART) provided technical assistance to Research Triangle Institute (RTI), the prime contractor implementing the Papua New Guinea (PNG) Electrification Partnership (PEP) Activity. This five-year project (2020-2025) partners with PNG's government to advance the country's self-reliance by helping achieve 70% population electricity access by 2030. Through expanding reliable and affordable electricity access, PEP aims to promote economic growth and community development throughout PNG.



Figure 1. PPL's main power systems in PNG.

BACKGROUND: PEP centers and coordinates its activities around four major objectives: (1) Strengthen PNG Power Limited's (PPL) Financial Viability and Operational Efficiency, which focuses on building PPL's capacity to sustainably improve its profitability and performance; (2) Develop Viable Off-Grid Electrification Models, which focuses on supporting improvements in off-grid and mini-grid markets; (3) Enhance PNG's Energy Regulator, which focuses on enhancing the capacity of the National Energy Authority (NEA) established in 2021; and (4) Catalyze Private Investment for Energy Projects, which focuses on contributing financial support for the implementation of Objectives 1-3.

PROJECT STATUS/RESULTS: Since 2021, HNEI GridSTART has been instrumental in advancing PEP's objectives through various technical assistance initiatives. The team has strengthened PNG's regulatory framework through several key contributions: reviewing and proposing amendments to the NEA Act, providing detailed analysis of the draft PNG Off-Grid Regulation, and updating PNG's Electricity Industry Regulations. In the technical

domain, HNEI GridSTART has evaluated International Electrotechnical Commission (IEC) standards for rural electrification by PNG's National Institute of Standards and Industrial Technology (NISIT). The team has also conducted specialized training on Hybrid Optimization of Multiple Energy Resources (HOMER) grid modeling software while developing ten District and Provincial Energy Plans to support remote area electrification.

In May 2022, responding to PEP's request, GridSTART supported NEA by reviewing and enhancing the Third-Party Access (TPA) Code and Grid Code for transmission-level interconnections. This work included developing and proposing interconnection standards for inverter-based resources (IBR) interconnected at the distribution level. The team then organized a four-day in-person workshop in November 2022 to address three key areas: the PNG Grid Code and distributed energy resource interconnections, the PNG TPA Code and technical regulations, and public consultation processes with NEA, PPL, and independent power producers. Throughout 2023, GridSTART continued refining both the TPA Code and Grid Code, adding a significant section on Distributed Generating Unit Interconnection Standards Technical Requirements, which was then presented to the NEA Board of Directors. Following stakeholder feedback in 2024, GridSTART participated in two public consultations on the draft Grid Code, which now awaits final adoption. Meanwhile, discussions continue with RTI regarding future support for PEP into 2025.

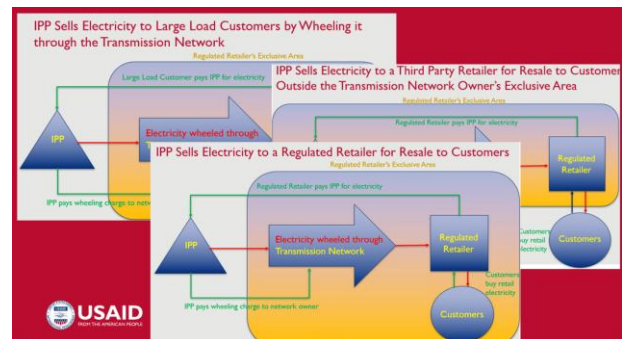


Figure 2. Slides illustrating NEA's TPA Code.

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