



Hawai'i Natural Energy Institute Research Highlights

International Support

Technical Interconnection Requirements for Solar and Wind Projects in Laos

OBJECTIVE AND SIGNIFICANCE: Under an Asia Pacific Regional Energy System Assessment (APRESA) Award from the Office of Naval Research, HNEI's Grid System Technologies Advanced Research Team (GridSTART) has developed technical interconnection and performance requirements and grid codes for solar and wind project grid interconnection in Laos.

BACKGROUND: Prior to this activity, HNEI GridSTART, in partnership with USAID Clean Power Asia (CPA), had drafted interconnection grid codes for Laos' first solar pilot auction. Since these interconnection grid codes were intended for ground-mounted PV systems of no more than 10 MW per the pilot auction's allowable capacity, Électricité du Laos (EDL) requested that the support be extended to interconnection grid codes for both utility-scale and distributed PV (DPV) and wind projects.

The technical grid code requirements have a direct impact on the counterparty risk allocation in a power purchase agreement (PPA), and thus affect the commercial and financial terms of the PPA. As such, the application of technical requirements that largely utilize the inherent capabilities of current wind and solar power conversion technologies to their fullest extent must be appropriately balanced with the "bankability" concerns of financing parties. Applying its experience in commercial PPA negotiations, comprehensive knowledge of industry best practices and prior technical support to various organizations on grid interconnection codes and standards for inverter-based resources, GridSTART was well-positioned to assist EDL in this foundational effort to facilitate Laos' energy transition initiatives.



Figure 1. Rooftop solar PV array in Luang Prabang, Laos.

PROJECT STATUS/RESULTS: HNEI GridSTART and USAID CPA met with EDL officials in March 2020 to launch the activity and secure necessary data and insights on EDL's grid operations.



Figure 2. HNEI GridSTART personnel and EDL officials at a meeting on March 12, 2020, at EDL Headquarters in Vientiane, Laos.

Following project launch, HNEI GridSTART commenced work on the development of two key deliverables: (1) *Électricité du Laos Distributed Solar Photovoltaic Generating Facility Interconnection Standards* (Dec 2020); and (2) *Électricité du Laos Inverter-based Generating Facility Transmission Interconnection Standards* (Jan 2021). These deliverables were submitted and presented jointly by HNEI and CPA to EDL and the Lao Ministry of Energy and Mines (MEM) in March 2021.



Figure 3. Project deliverables submitted to EDL and Lao MEM.

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