Hawai'i Natural Energy Institute Research Highlights

International Support

Recommendations on Methodology for Vietnam Power Development Plan (PDP)

OBJECTIVE AND SIGNIFICANCE: As the Vietnam economy surges ahead driving dramatic year-over-year increases in energy demand, the Vietnam Low Emission Energy Program (V-LEEP) aims to help the Government of Vietnam (GVN) establish an effective policy, regulatory, and incentive environment for low-emission growth in the energy sector, while simultaneously attracting public- and private-sector investment in alternative energy development and energy efficiency measures.

Figure 1. Day and night views of Ho Chi Minh City.

Under an Asia Pacific Regional Energy System Assessment (APRESA) Award from the Office of Naval Research (ONR), HNEI's Grid System Technologies Advanced Research Team (Grid***START***) is collaborating with Deloitte Consulting, the V-LEEP prime contractor, delivering technical assistance to the GVN to address their energy growth issues.

BACKGROUND: V-LEEP has, among other key initiatives, supported Vietnam's Ministry of Industry and Trade, Electricity and Renewable Energy Authority (MOIT/EREA) to develop Vietnam's eighth Power Development Plan (PDP-8), which is expected to incorporate advanced energy solutions, and more diversified sources of alternative energy at higher grid penetration to deliver energy security for Vietnam. Vietnam's PDP-8 will be the cornerstone ministerial-level plan that shapes the future of Vietnam's expanding power sector.

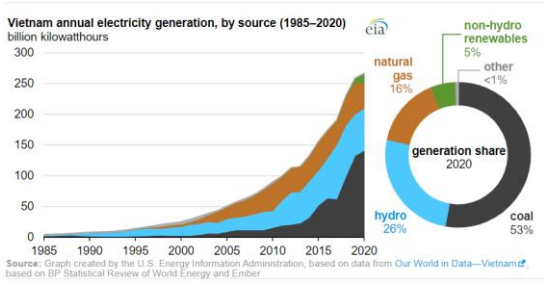

Figure 2. Vietnam's rapid growth in electricity production and resource mix.

HNEI Grid***START*** contributed to V-LEEP's report to MOIT/EREA on a new methodology roadmap to update the historical PDP process and to incorporate international best practices for planning for higher levels of energy from variable/intermittent energy resources. Based on the results of this assessment, MOIT/EREA has adopted V-LEEP's recommendations on a new process and methods, including the use of advanced grid simulation tools for PDP-8 analyses, including specific steps and a roadmap for implementation.

PROJECT STATUS/RESULTS: MOIT/EREA established a Modeling Working Group (MWG) to conduct production cost analysis for the development of PDP-8. HNEI Grid***START***, together with V-LEEP and NREL, conducted two technical training courses for the MWG and other relevant stakeholders in 2019.

The first training, *Introduction to Production Cost Modeling for Power Development Planning*, held on November 19-21, 2019, was geared towards the Technical and Core Modeling Sub-Group of the MWG. The objective was to help participants better understand how production cost modeling can be used to analyze the operational costs and feasibility of future PDP scenarios, particularly those with higher levels of variable/intermittent energy generation. Participants were enabled to construct a model of Vietnam's grid using PLEXOS, an advanced energy market simulation software. The second training, held on December 18-19, 2020, introduced a System Advisor Model (SAM). Topics covered included flexible technologies, operating reserves, model calibration and validation, and least regrets planning.

In March 2021, with significant analytical and writing contributions by HNEI Grid***START*** and NREL, Deloitte delivered to MOIT/EREA a technical report analyzing the impact of significant variable/intermittent energy penetrations on Vietnam's power sector using a PLEXOS-based analysis of long-term power development planning. The issues identified in the analyses employing advanced modeling tools can be used as feedback for generation and transmission planners to optimize the PDP-8 using the least-regret approach.

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