



# Hawai'i Natural Energy Institute Research Highlights

## International Support

### ASEAN Interconnection Masterplan Study (AIMS) III Support

**OBJECTIVE AND SIGNIFICANCE:** Under HNEI’s Asia Pacific Regional Energy System Assessment (APRESA) award from the Office of Naval Research, HNEI’s Grid**START** team is providing technical assistance as a core member of the Technical Review Group (TRG) for the ASEAN Interconnection Masterplan Study (AIMS) III effort. The TRG is comprised of international experts tasked with performing reviews and providing guidance on the scope, data needs, assumptions, analyses and results of AIMS III.

**BACKGROUND:** As a basis for assessment, regional planning and development of a prospective integrated ASEAN Power Grid, the ASEAN countries – led by the Head of ASEAN Power Utilities/Authorities (HAPUA) – have conducted three AIMS studies to date. The first study, AIMS I, was completed in 2003 and proposed a comprehensive power transmission network. The second study, AIMS II, completed in 2010, addressed the viability of generic cross-border links based on bilateral agreements.

The latest development in this phased study, AIMS III, began in 2019 and builds upon the foundational work of the previous two studies. It aims to evaluate ASEAN power market integration through the grid connection of renewable energy and cross-border power trade amongst the 10 ASEAN Member States’ (AMS). Specifically, AIMS III seeks to address: rapid changes in the economic landscape and electricity supply; renewable energy integration (including the ASEAN RE target of 23% of the energy mix by 2025); benefits and challenges of higher variable renewable energy (VRE) integration; adoption of new emerging technologies; and the sustainability and advancement of multilateral power trade.

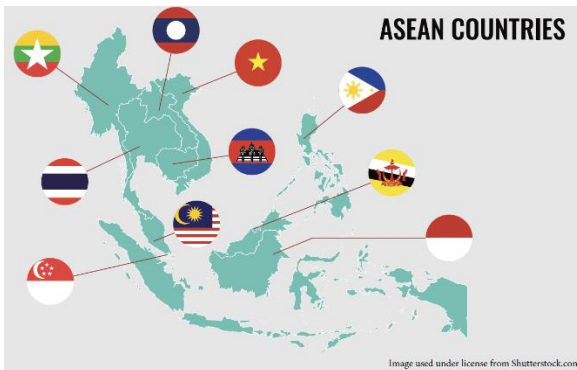


Figure 1. Map and flag representations of the AMS.

**PROJECT STATUS/RESULTS:** The AIMS III work is divided into three phases as follows:

Phase 1, Capacity Expansion Planning, has been completed. Under this phase, the technical potentials of VRE were identified and mapped out for the AMS. Proposals for firm generation additions and cross-border interconnections were made under different load and renewable energy scenarios. These resource scenarios were then assessed using production cost analysis to evaluate transmission flows and excess energy curtailment potentials.

Phase 2, Grid Performance Analysis, has also been completed. Current findings indicate that the interconnections proposed under Phase 1 are feasible; however, several AMS, such as Laos, Myanmar, and Cambodia will require grid strengthening for high VRE scenarios in 2030 and beyond.

Phase 3, Multilateral Market Analysis, is forthcoming and will seek to identify the barriers and challenges for VRE integration in cross-border and multilateral electricity trading.

HNEI Grid**START** provided training to the ASEAN Center for Energy (ACE), an intergovernmental organization within the ASEAN structure representing the AMS interests in the energy sector, on production cost analysis and use of the PLEXOS software tool to empower ACE personnel to more effectively carry out project management duties for the AIMS III study.



Figure 2. Overview of ASEAN power grid.

**Funding Source:** Office of Naval Research

**Contact:** Leon Roose, [lroose@hawaii.edu](mailto:lroose@hawaii.edu)

**Last Updated:** November 2021