



Hawai'i Natural Energy Institute Research Highlights

International Support

Mapping of Renewable Energy Sector Innovation System

OBJECTIVE AND SIGNIFICANCE: Under this effort, HNEI provided financial support and guidance to the National Institute for Science and Technology Policy and Strategy Studies (NISTPASS) in the Vietnam Ministry of Science and Technology to map the innovation opportunities associated with renewable energy (RE) sector development in Vietnam. This included identifying which Vietnamese stakeholders in the RE sector can benefit from further policy and institutional support.

BACKGROUND: With rapidly growing industrialization and modernization of the economy, energy demand in Vietnam increased rapidly between 2016-2020 and is predicted to increase by eight percent per annum through 2030, resulting in a four-fold increase in total electricity demand compared to 2014. While the development of renewable energy resources in Vietnam is a government priority, there has been a lack of clarity about the role of many organizations in Vietnam impacting energy development, the relationship between them, and the policies required to foster energy innovation.

PROJECT STATUS/RESULTS: This project began in August of 2019 and was largely completed at the end of 2023.

In 2020, NISTPASS completed its initial assessment of the innovation and RE sector innovation system (SIS) in Vietnam. This mapping, based on the National Systems of Innovation Concept, adapted from the Organisation for Economic Co-Operation and Development (OECD), included the functions and challenges of the SIS, stakeholders and linkages and mutual learning between stakeholders, and preliminary concepts on policy to promote the SIS. During their assessment, NISTPASS drew the following conclusions for mapping sector innovation systems in renewable energies:

- A sector system of innovation includes technologies, key knowledge, and learning processes of the sector, actors/stakeholders, institutions that regulate linkages between actors, and specific demands;
- Key knowledge and technologies should span across the whole value chain;
- Actors/stakeholders include firms of different ownership and size, academic organizations,

intermediary organizations, and government agencies issuing institutions;

- Linkages among these actors/stakeholders include cooperation, transaction, competition, and exchange of knowledge, experiences, embodied technologies; and
- Institutional framework that regulates these linkages should include explicit official policy documents and actions, and implicit practices and regulations.

Building upon their initial assessment, NISTPASS held three scientific workshops between March and July 2021. Topics discussed during these workshops included: the existing issues of solar and wind power development in Vietnam, analysis of the institutions and policies affecting RE industry development, and policy recommendations. In 2021 and 2022, NISTPASS completed two rounds of interviews with stakeholders in the renewable energy sector in Vietnam, focusing on solar and wind energies. Solar and wind energy were given a greater focus due to the large generation potential for these resources in Vietnam and the country's official Power Development Plans.

In April 2023, NISTPASS held a workshop focused on presenting the key findings of the study, while also allowing further discussion with stakeholders to fine-tune research results. Workshop participants visited a solar farm in Khanh Hoa province and discussed collaboration on RE technology upgrading and utilization.

The project provided a substantial amount of data for analysis due to the combination of an exhaustive literature review, stakeholder analysis, workshop discussions, and two rounds of in-depth interviews with selected key stakeholders. Incorporating inputs from the scientific workshops and interviews, NISTPASS identified 21 trends and findings and produced a final technical report titled "[*Sectoral Innovation System in Renewable Energy: Case of Solar and Wind in Vietnam.*](#)"

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