UNIVERSITY OF HAWAIʻI SYSTEM
Legislative Testimony

Testimony Presented Before the
Senate Committee on Water and Land and
Senate Committee on Energy, Economic Development, and Tourism
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By
Richard Rocheleau, Director
Hawaiʻi Natural Energy Institute
And
Michael Bruno, PhD
Provost
University of Hawaiʻi at Mānoa

SB 2510 – RELATING TO RENEWABLE ENERGY

Chairs Inouye and Wakai, Vice Chairs Keith-Agaran and Misalucha, and members of the committees:

SB 2510 proposes to establish specific mandates for the minimum percentages of annual firm renewable energy generation and maximum energy contribution of any individual technology on each of the island grids. Such mandates have the stated intention of achieving "greater diversification of renewable energy generation to include intermittent and firm renewable generation to improve reliability and achieve one hundred per cent renewable energy objectives." These mandates also have the intention of providing "reliable replacement of fossil fuel generation with firm renewable generation." SB 2510 further directs that future expansion of the energy system consider not only least-cost energy supply, but also long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits that may offset monetary costs. SB 2510 also appropriates funding for the Hawaiʻi Natural Energy Institute (HNEI) to conduct a study to update, on a regular basis, the minimum percentage of firm generation and the maximum proportion of any one renewable energy source on each island.

While HNEI **supports the intent** of this bill, we are concerned that a legally-binding fixed minimum percentage of renewable energy from firm generation may be overly prescriptive, not yield optimal solutions, and likely slow Hawaii's clean energy transition. Various analyses conducted by HNEI indicates that there may be significant cost benefits to maximizing energy production from lower-cost variable (intermittent) resources while also improving reliability.

While there may be cost benefits to maximizing the energy production from the lower-cost variable resources, HNEI analysis to date shows that significant amounts of firm capacity will be required to reach our 100% goals. For example, analysis on Oʻahu

including electrification of transportation suggests that up to 800 MW of firm **capacity** will be required to meet our 100% goal and maintain reliability, even in scenarios with a high penetration of solar and wind with battery energy storage. Please keep in mind, however, that most of these firm resources will operate infrequently, largely filling in gaps that arise due to low wind and solar events. HNEI further acknowledges that diversity of resources should be evaluated in regard to ensuring reliability, stability, and resilience of our integrated electrical/transportation systems, but believes that it is premature to set a maximum for any specific generation technology.

Consistent with our statutory role, HNEI collaborates with and provides analysis and technical assistance to key energy stakeholders including the Hawaii Public Utilities Commission, the Hawai'i State Energy Office, and the Hawaiian Electric Company (HECO) to help address these issues. HNEI would enthusiastically work in collaboration with these and other stakeholders, if so directed, to develop a suite of energy options that addresses issues beyond just least-cost, which could then inform future policies and regulations on options available to promote system reliability and facilitate oil plant retirements. HNEI has sufficient funds from its Barrel Tax allocation to conduct this study and does not need a separate appropriation at this time.

Accordingly, HNEI respectfully recommends the following amendments to the current draft, consistent with the intent of the SB 2510 to promote resource diversity and reliability, but without specifying a minimum firm renewable generation requirement.

Section 1 (3) Amend to state "Establish a state energy policy that requires sufficient renewable energy to be generated by firm renewable energy to achieve 100% renewable energy goals, while maintaining grid reliability.

Section 1 (5) Amend to state "Amend other statutory provisions to achieve 100% renewable on each island while maintaining grid reliability and stability.

Section 2 (a) 7: Amend to state "Reliable replacement of all fossil fuel generation with a portfolio of variable and firm renewable generation, storage, and end-user technologies that will ensure equal or improved grid reliability"

Section 2 (a) 8: Amend to state "Use the results of the study by the Hawai'i Natural Energy Institute, as described in section 7 of Act_____, Session Laws of Hawaii 2022 to propose guidance for the relative amounts of firm generation – along with a diverse set of renewable resources and technologies - to be integrated into the various island electrical grids."

Section 2 (a) 9: Amend to state "Explicitly consider the impact of diversification of the generation portfolio on cost, reliability, and resilience of the island grids."

Section 2 (a) 10: Amend to state “Fossil fuel generation shall be prohibited after December 31, 2045, except in the cases of emergencies, natural disaster, or a situation where unavailability of renewable fuels would require limited use of fossil fuels to maintain grid reliability.”

Section 2 (c) 13: Amend to state “Ensure that the development or expansion of energy systems recognizes and emphasizes the need to include enough firm generation to ensure system reliability equal to or better than current levels.”

Section 2(c) 14: Amend to state “Explicitly consider the impact of diversification of the generation portfolio on cost, reliability, and resilience of each of the island grids.”

Section 3(b) 8: Amend to state “Accelerate research and development of new energy related industries for variable and firm renewable energy sources including, but not limited to, wind, solar, ocean, underground resources, bioenergy, and solid waste. Also accelerate research and development of energy related industries based on enabling technologies including, but not limited to, energy storage, demand response, electrification of transportation, grid modernization, and end-use energy efficient systems.”

Section 7: Amend to state “The Hawai‘i Natural Energy Institute shall conduct an initial study followed by regular updates to identify the recommended percentages of firm renewable generation and diversity of the energy portfolio for each island necessary to ensure that the reliability of the electrical grid is equal to or better than that achieved during the 2021 calendar year. A preliminary report shall be submitted to the legislature twenty days prior to the convening of the regular session of 2023 with a final report to be submitted twenty days ahead of the 2024 legislature with updates to be submitted every two years after the 2024 submission.

Section 8: HNEI currently has sufficient funds from its Barrel Tax allocation to conduct this study and does not need a separate appropriation.

Thank you for the opportunity to provide this testimony on SB 2510.