



# Hawai'i Natural Energy Institute Research Highlights

## Energy Policy & Analysis

### Evaluation of the State Renewable Portfolio Standards Mandate

**OBJECTIVE AND SIGNIFICANCE:** The State of Hawai'i's ("State") energy policy is driven, in significant part, by the State's Renewable Portfolio Standards (RPS) that mandate the percentage of electricity that must be generated from renewable energy resources at different times until achieving 100% in 2045. The RPS targets have evolved through several legislative amendments since the RPS was first established in 2001. The current RPS, under § 269-92, Hawai'i Revised Statutes (HRS), was modified by ACT 140 of the 2022 legislature requiring electric utilities in the State to report electricity from renewable sources based on a percentage of electricity generation including distributed generation.

HNEI is required by legislation to provide regular technical analysis and assistance to the Hawai'i Public Utilities Commission (PUC). As part of this assistance, HNEI provides the PUC with an update of the status of the RPS every five years. This year's [analysis report](#) is the fourth that HNEI has performed since 2008. HNEI's analysis is used by the PUC in the development of their report to the legislature.

**BACKGROUND:** Hawai'i's RPS is intended to promote Hawai'i's energy policy goals by encouraging the development and implementation of locally-sourced renewable energy generation connected to Hawai'i's utility electricity systems, resulting in the displacement of existing fossil fuel generation and reducing the State's dependence on imported oil. The PUC is required by statute to evaluate Hawai'i's RPS every five years and report its findings to the Legislature. The objective is to determine if the standards established by HRS § 269-92 remain effective and achievable based on progress to date and to analyze options for meeting RPS targets in the future. Hawai'i's initial RPS was established in 2001 (Act 272, Session Laws of Hawai'i 2001). The most recent modification to the RPS occurred in July 2022. Act 240 (HB 2089) was signed into law that amended the RPS calculation from renewable energy as a percentage of sales to renewable energy as a percentage of total system generation. The new calculation is based on total generation (including generation from private rooftop solar, in the denominator) and total renewable generation (including generation from private rooftop solar, in

the numerator). The current RPS goals, by year, are summarized in Table 1.

Table 1. Hawai'i's Renewable Portfolio Standards by year.

Compliance Year	RPS Requirement (% of Generation)
2010	10%
2015	15%
2020	30%
2030	40%
2040	70%
2045	100%

**PROJECT STATUS/RESULTS:** The RPS is applied separately to Kaua'i Island Utility Cooperative (KIUC) and Hawaiian Electric Company (HECO). In performing the analysis necessary for this Report, the HNEI relied on several sources of information including:

- *Annual Utility RPS Status Reports:* Each of Hawai'i's electric utilities provides annual reports identifying the amount of energy generated by renewable sources and the achievement of the RPS requirements. These reports identify renewable generation resources that are operating as of the dates of the reporting periods. The Commission relies on these reports to quantify historical and existing renewable energy generation. The most recent reports by each utility indicate RPS achievement information for the calendar year 2022.
- *Future Renewable Generation Projects:* This includes new renewable generation projects that provide electrical power to each utility. Expected renewable generation for these projects is provided by the utilities, based on current estimates. The Commission relies in this Report on approved applications to quantify expected renewable energy generation from projects that are under construction or substantially in progress. In addition, for the HECO Companies, the ongoing competitive-bid process for new renewable generation includes information regarding the possible scope of new renewable resources in the near- to-mid-term. For HECO, more than 500 MW of renewable projects are expected to come online in the next few years.
- *Mid- and Long-Range Utility Planning Estimates:* Hawai'i's electric utilities also

provide the Commission with mid-term and long-range planning information and projections of expected and possible capital expenditures in filed reports, periodic briefings, and the Integrated Grid Planning (IGP) process. Planning information includes identification of possible specific future renewable generation projects, possible requests for proposals, and general estimates of possible resource potential.

- *Additional Expert Opinion:* External expert opinion was also factored into the analysis and commentary. A number of anonymized state-based experts were interviewed to obtain their views on the future achievement of RPS goals. These experts including those from non-governmental organizations (NGOs), independent power producers, the utilities, academia, and state agencies.

Key findings in HNEI’s 2023 Report include:

- Achievement of the 2030 RPS requirement of 40% is likely for HECO service territory, which includes O’ahu, Maui County, Hawai’i Island, and is essentially certain for KIUC. As of 2022, KIUC has already achieved the 2030 goal.
- Based on current plans for the PUC approved Stage 1 and Stage 2 PV plus storage projects, the HECO territory is expected to reach the 40% by 2030. However, force majeure and related supply chain issues have created problems for State 1 and Stage 2 projects. If these issues continue, it could create problems in achieving the 40% mandated goal. Additionally, the recent Lahaina wildfires could potentially impact the pace of new renewable energy generation on Maui.
- The RPS has led to a substantial reduction of Greenhouse Gases (GHGs) being emitted in the electricity sector. However, GHGs have not diminished significantly in other sectors (transportation, buildings, etc.) as much as the Hawai’i Clean Energy Initiative (HCEI) originally projected.
- Increasing electric loads from electric vehicle adoption will make it more difficult to achieve the RPS targets in the future, but will ultimately benefit statewide emissions.
- The costs of renewable energy projects under development and recently proposed in Hawai’i remain at or below costs of oil-fired generation, making renewable projects cost-competitive

alternatives compared to continuing to utilize fossil fuel generation resources. However, recent events including delays in the development of HECO Stage 1 and 2 projects have led to increased costs for renewable energy development and deployment.

- Initial analysis by HNEI to explore the ability to integrate solar plus storage or solar/wind and storage suggests that reaching the 70% RPS target by 2040 is feasible and likely cost effective with current technologies. However, land use, community engagement, and transmission will need to be carefully managed.
- The RPS remains effective in helping the State achieve its policies and objectives with respect to developing renewable energy resources in Hawai’i.

However, it should be noted that in 2022, while customer-based generation was the largest single source of renewable energy at the end of the year, the advances in the development of utility-scale renewable generation have been significant since the 2018 assessment. Figure 1 is a pie chart showing the relative percentages of resources providing electricity from renewables statewide.

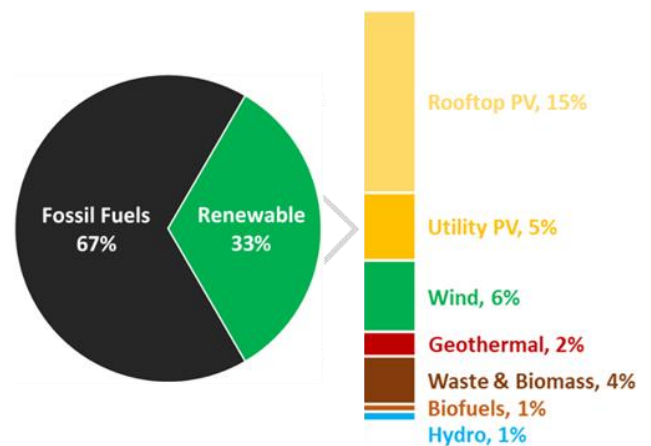


Figure 1. Percentages of renewable resources and technologies providing electricity for Hawai’i.

Figure 2 shows progress against the RPS by Island. The Report provides additional detail for the KIUC and HECO service areas. The downturn evident for 2022 is due to the new method required for estimation of the renewable fraction which is now based on total generation, not just utility sales.

While the outlook for meeting the 2030 goals is excellent, the Report notes a number of concerns about meeting the future RPS mandated goals (70% in 2040 and 100% in 2045). This concern is due to a variety of factors. These include issues concerning reliability and resiliency, land availability (particularly on O‘ahu), local community acceptance, transmission interconnections, the demand increased electrification of transportation and buildings will place on the RPS, and uncertainties regarding the emergence of newer technologies and resources to meet the expected need for dispatchable firm power to maintain reliability. A more complete discussion can be found in [HNEI’s Report to the PUC](#).

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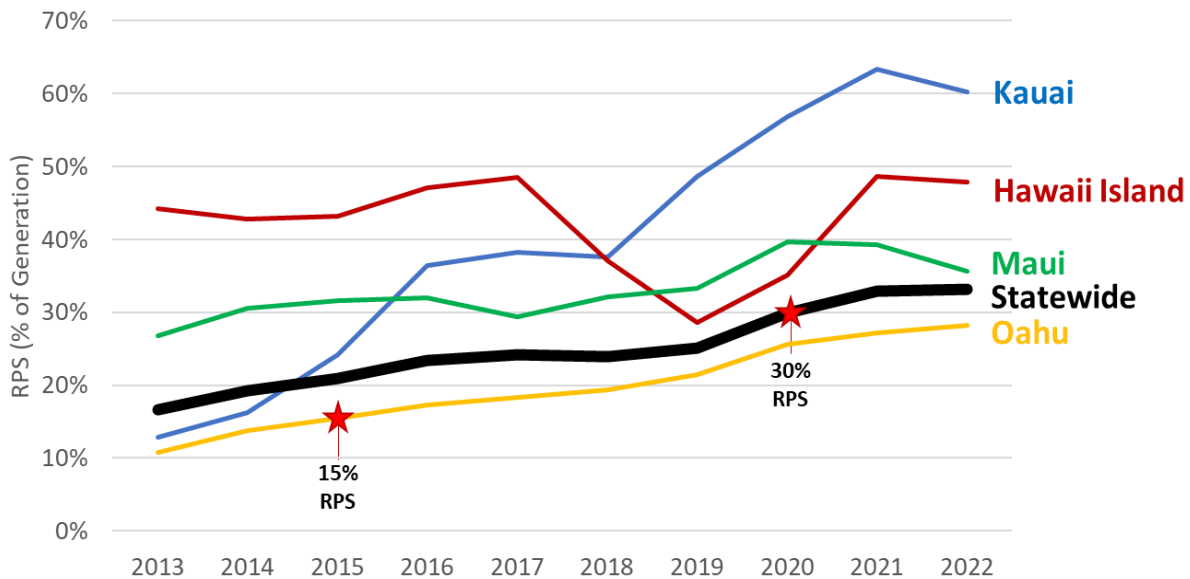


Figure 2. Consolidated progress in meeting RPS goals by Island.