

Hawai'i Powered



# Hawaiian Electric's Integrated Grid Plan

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ESIG Fall Technical Workshop Session 6:  
Cutting Edge Practices in Integrated Planning

October 23, 2024

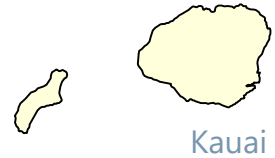


Hawaiian  
Electric

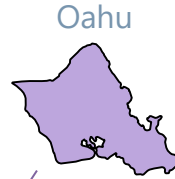
# Hawaiian Electric today

Serving the State of Hawaii for 133 years

Over 95% of state's population served by Hawaiian Electric and its subsidiaries



Kauai



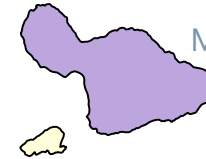
Oahu



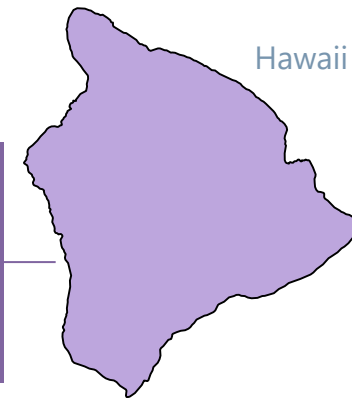
Molokai



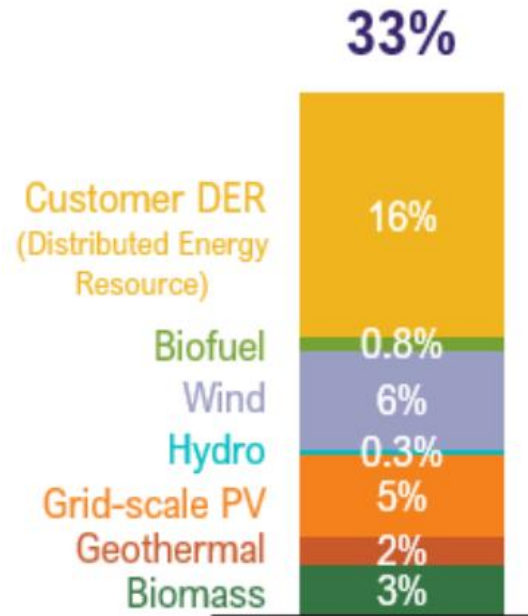
Lanai



Maui



Hawaii



Consolidated

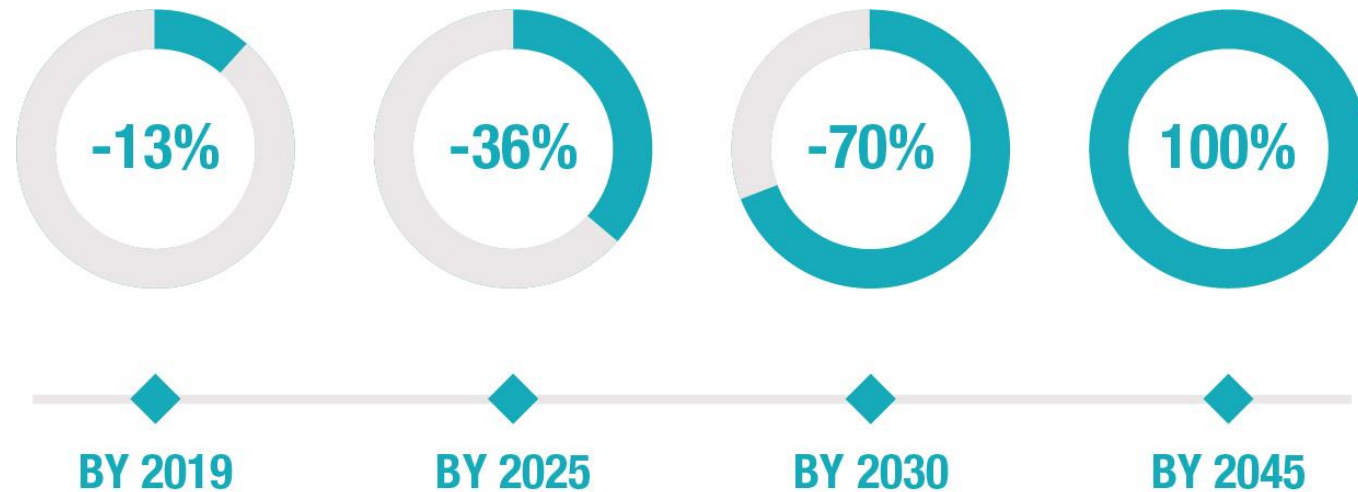
**Oahu**  
Customers: 308,721  
Renewable generation: 29.6%

**Maui County**  
Customers: 73,788  
Renewable generation: 35.4%

**Hawai'i Island**  
Customers: 88,103  
Renewable generation: 52.1%

Note: All data as of 12/31/23 unless otherwise noted

# 2045 GOAL: Net Zero Carbon Emissions



Hawai'i has the most ambitious clean energy goals in the nation.

**Hawaiian Electric is committed to 100% reduction of carbon emissions by 2045.**

# The IGP Process



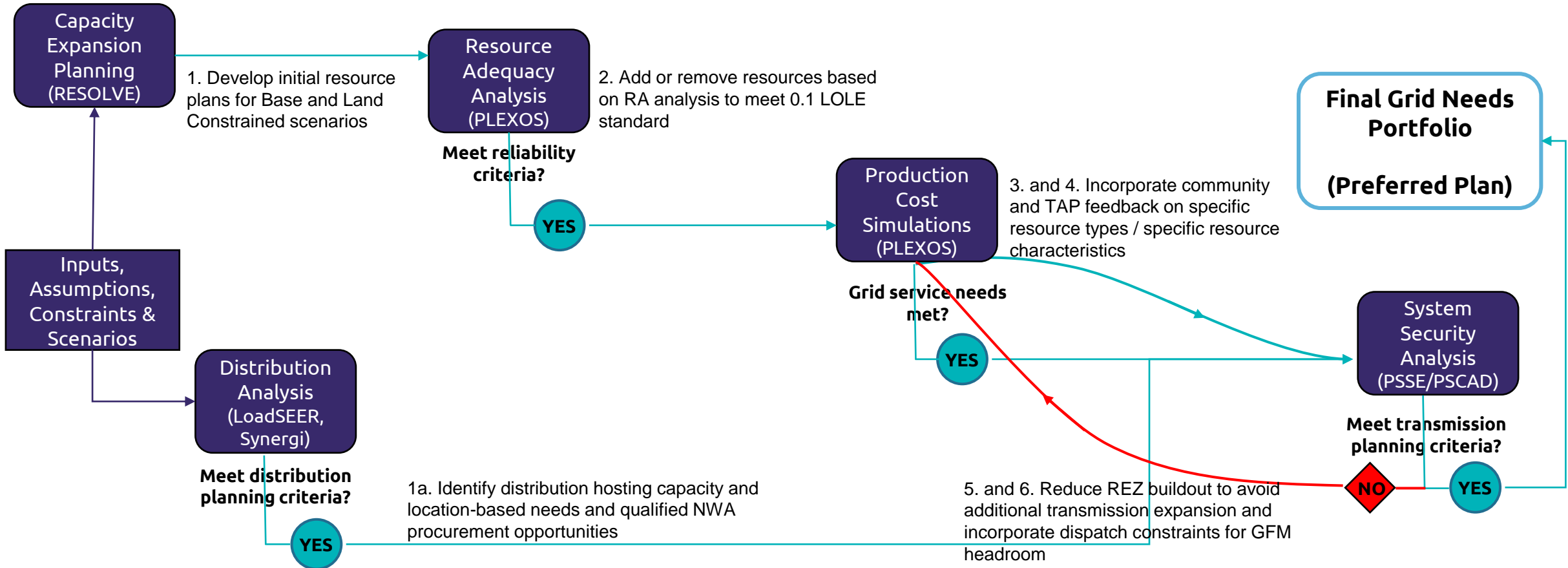
# Pathways to 100% RPS



Pathway	Overview
<b>Base</b>	Based on current policy and market conditions, the most likely adoption of customer technologies (private rooftop solar, energy storage, electric vehicles, and energy efficiency). Customers manage EV charging.
<b>Low Load</b>	High adoption of energy efficiency and private rooftop solar, but EV adoption remains slow. Electricity demand is lower than in all other pathways.
<b>Faster customer technology adoption</b>	High adoption of all customer technologies compared to the market forecasts and EV owners manage their charging. Electricity demand is higher than the Base but lower than the High electricity demand pathway.
<b>High Load</b>	Slower adoption of customer technologies; however, EV adoption accelerates because of aggressive State or federal policies, and owners charge their vehicles when the grid is most stressed (i.e., unmanaged EV charging). Electricity demand is much higher than in all other pathways.
<b>Land-constrained</b>	This pathway recognizes the possibility on O‘ahu that insufficient land may be available to develop large-scale resources or to produce local biofuels. This pathway evaluates the impact of limited land availability for future solar, onshore wind, and biomass development. This scenario uses the Base electricity forecast.

# Modeling to Determine Grid Needs

The Preferred Plans for each island were developed as a result of the resource, transmission, and distribution analyses.



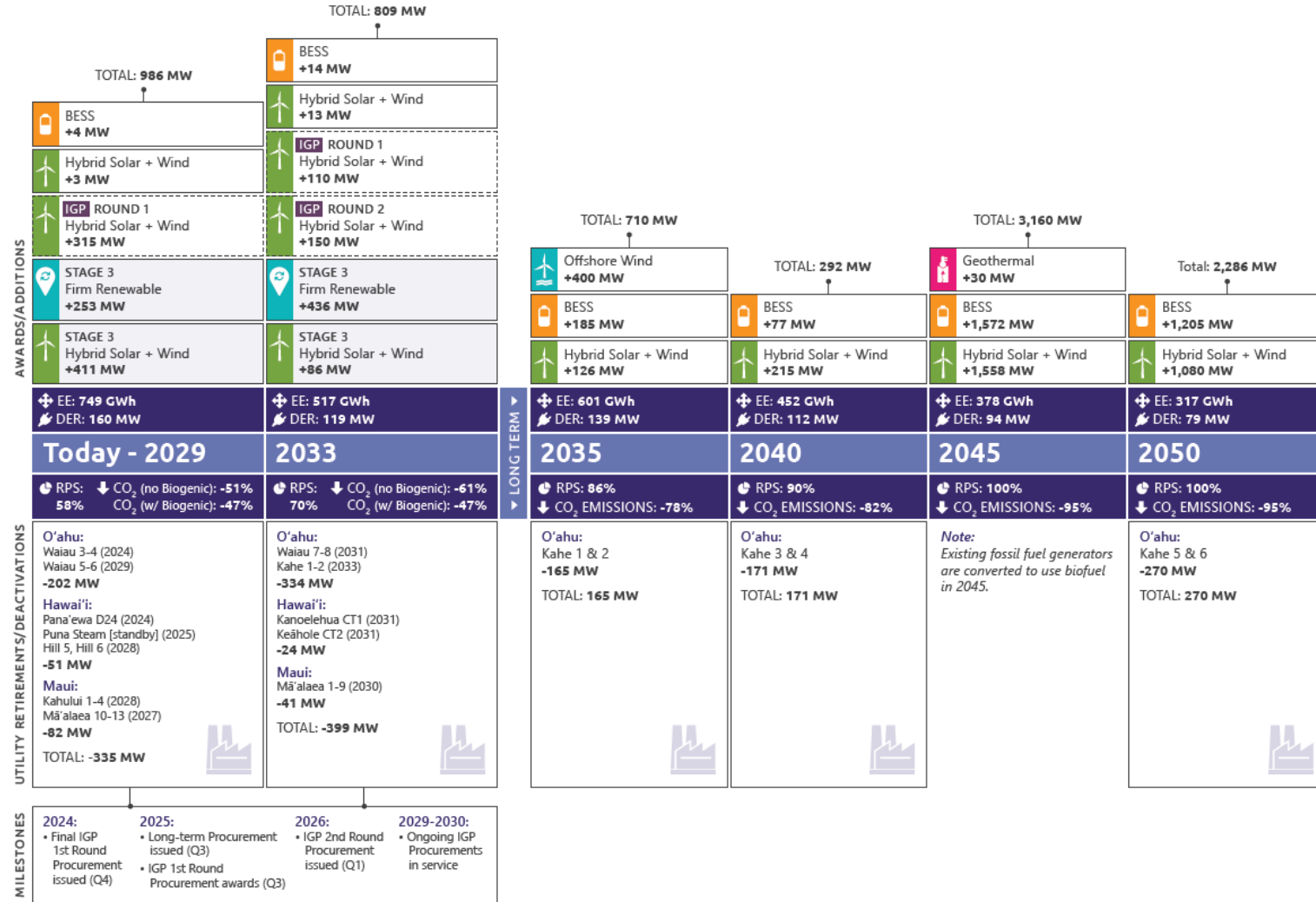
# Integrated Grid Plan (IGP) Accepted by the Commission on March 7, 2024

The plan calls for additions of solar and wind generation, expansion of the transmission system, continued growth in DERs, and the addition of firm generation (including geothermal).

This portfolio would allow for desired fossil generation retirements and to meet 2045 decarbonization goals in a reliable and resilient fashion.

Recognizing the need for a plan that all stakeholders can achieve and concerns on implementation, land use, and community acceptance of the renewable energy targets, particularly on O‘ahu, the plan proposes to use the Land-Constrained Plan for O‘ahu.

PUC approval of the plan was requested to allow for faster regulatory process and execution of projects and programs.



# [Some] Key Changes Needed to Advance Integrated Planning

## Continued Engagement with Stakeholders and Community

- Agreement on appropriate capacity accreditation methods that are reliable and robust but also balance the amount of effort needed by grid planners to develop them and stakeholders to understand them
- Common understanding of assumptions and methods between stakeholders involved in the plan development and stakeholders involved in the RFPs and programs that result from the planning
- Shift from solely focusing on generation to generation + T&D

## People and Processes

- Better modeling tools that can cover more parts of the planning process instead of needing to rely upon separate tools for separate process steps
- Improved communication/handoffs (and translation) across all planning and operation areas

## Technology

- Continued improvement in the performance of DER and Utility-Scale inverter-based resources
- Proven technologies capable of improving operation of highly distributed, IBR-rich grid





Mahalo for your time

Any questions?

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