

Electricity Regulation in Hawaii

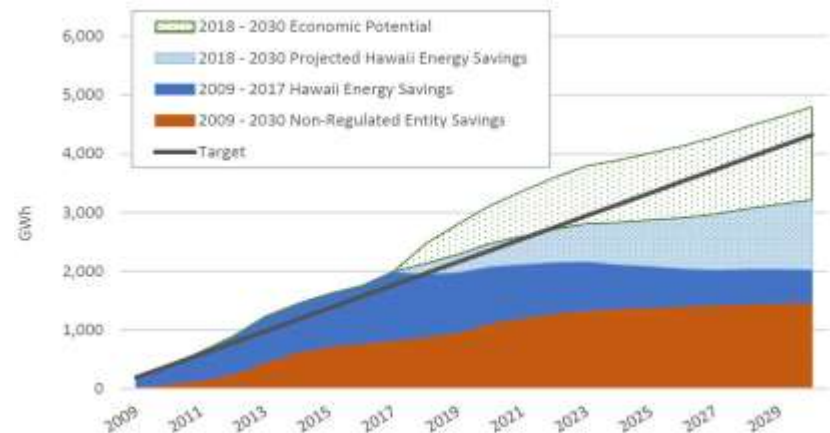
Caroline Ishida, Chief Counsel
Hawaii Public Utilities Commission
October 11, 2019

Hawaii's Clean Energy Policies

- Hawaii has some of the most aggressive clean energy policies in the country
 - 100% Renewable Portfolio Standard by 2045
 - 4,300 GWh Energy Efficiency Portfolio Standard by 2030
- Each of the islands is rapidly advancing towards these overarching policy objectives
- Success will represent a dramatic transformation of the electricity sector in Hawaii



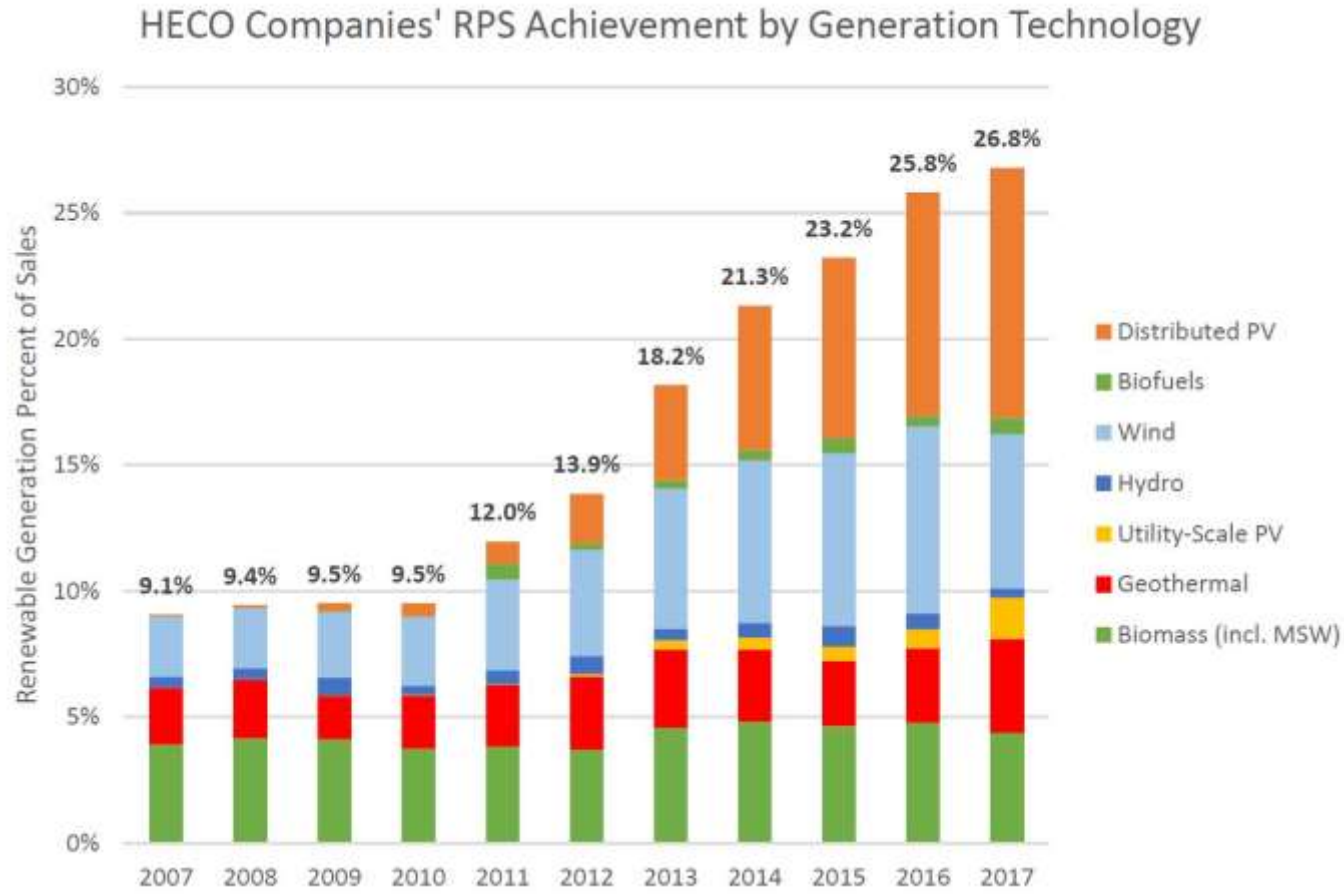
Source: Hawaii PUC 2018 RPS Report



Source: Hawaii PUC 2018 EEPs Report



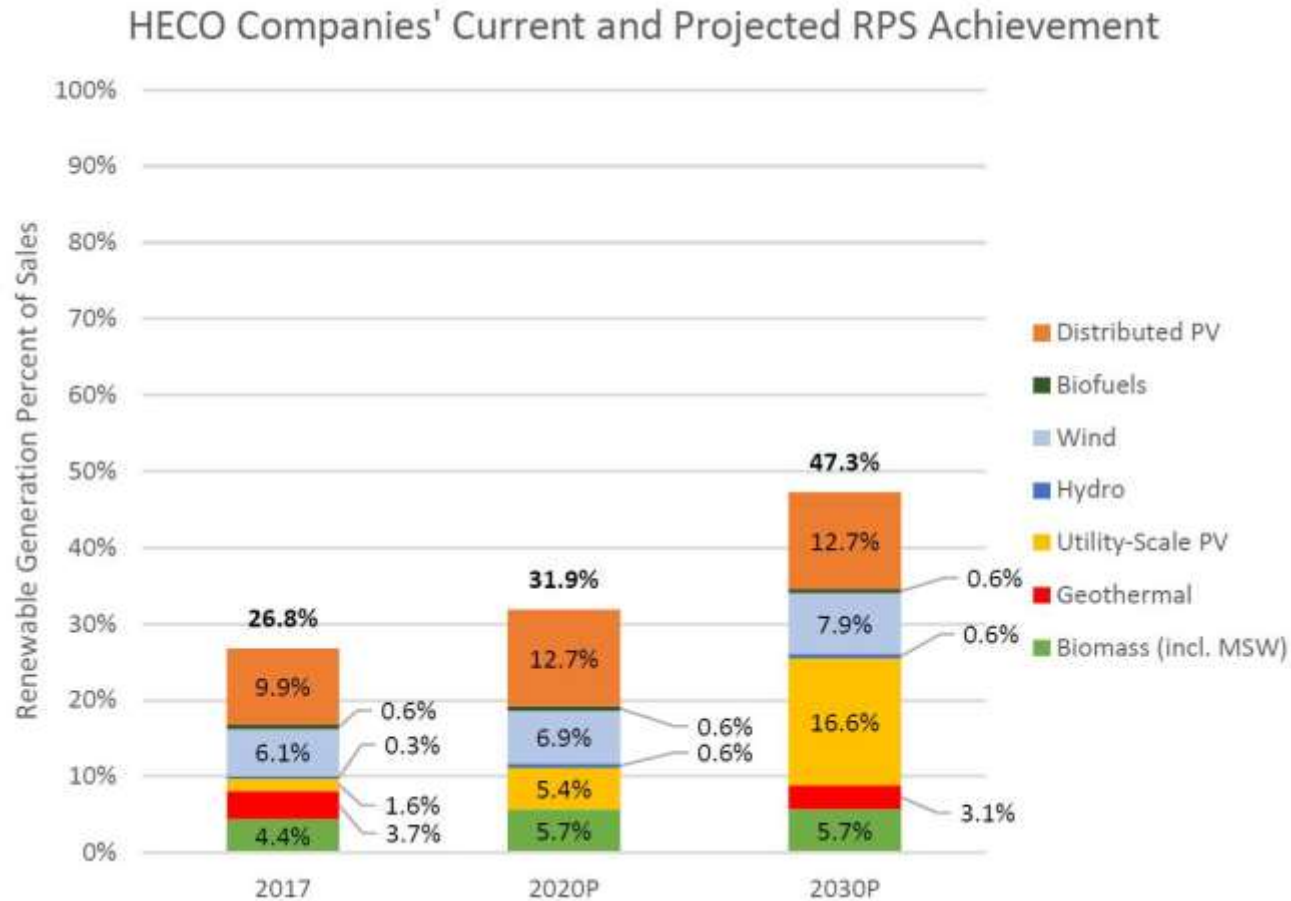
HECO Companies Historical RPS and Projected Future Achievement



Source: Hawaii PUC 2018 RPS Report



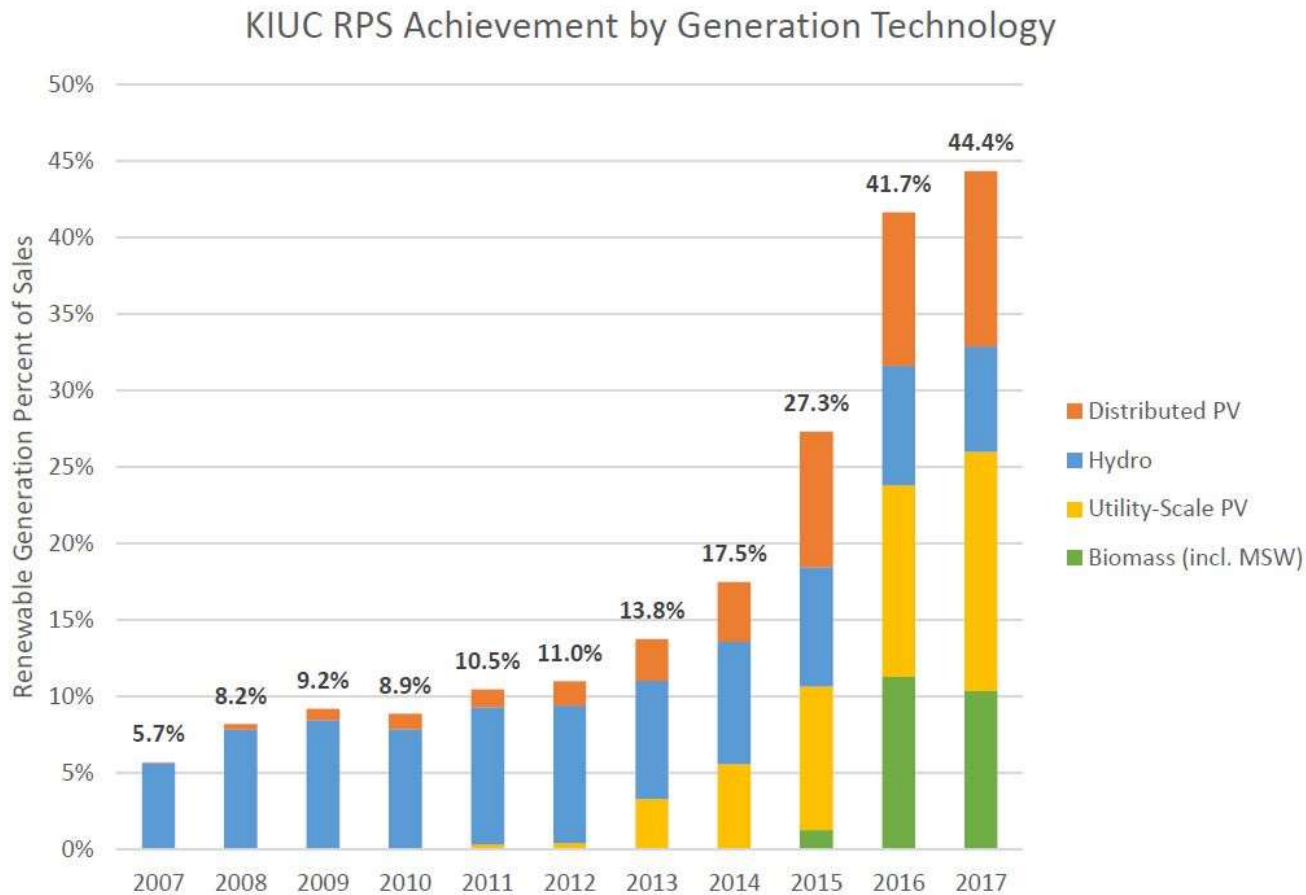
HECO Companies Historical RPS and Projected Future Achievement



Source: Hawaii PUC 2018 RPS Report



Kauai Island Coop Historical RPS and Projected Future Achievement

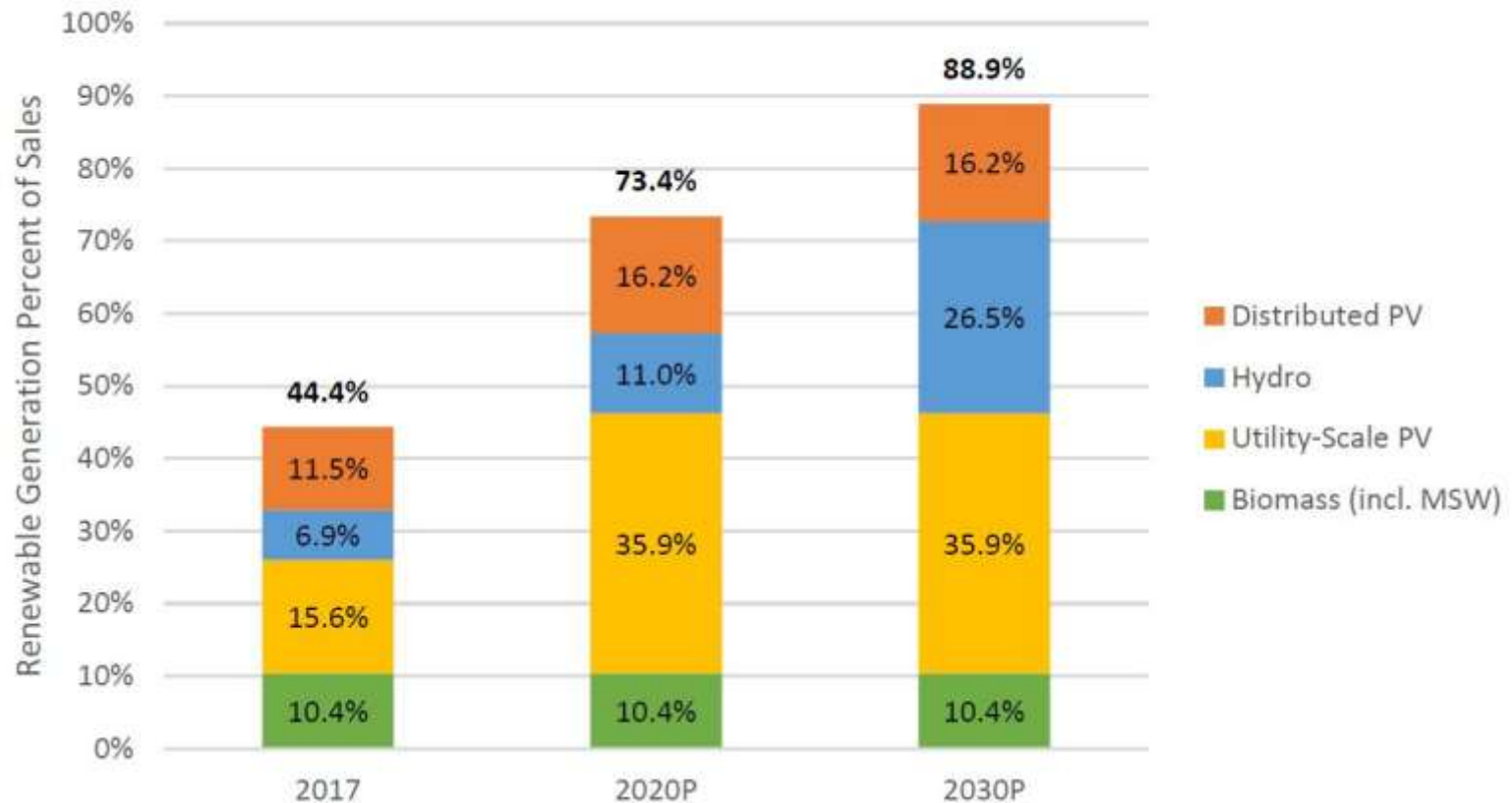


Source: Hawaii PUC 2018 RPS Report



Kauai Island Coop Historical RPS and Projected Future Achievement

KIUC Current and Projected RPS Achievement

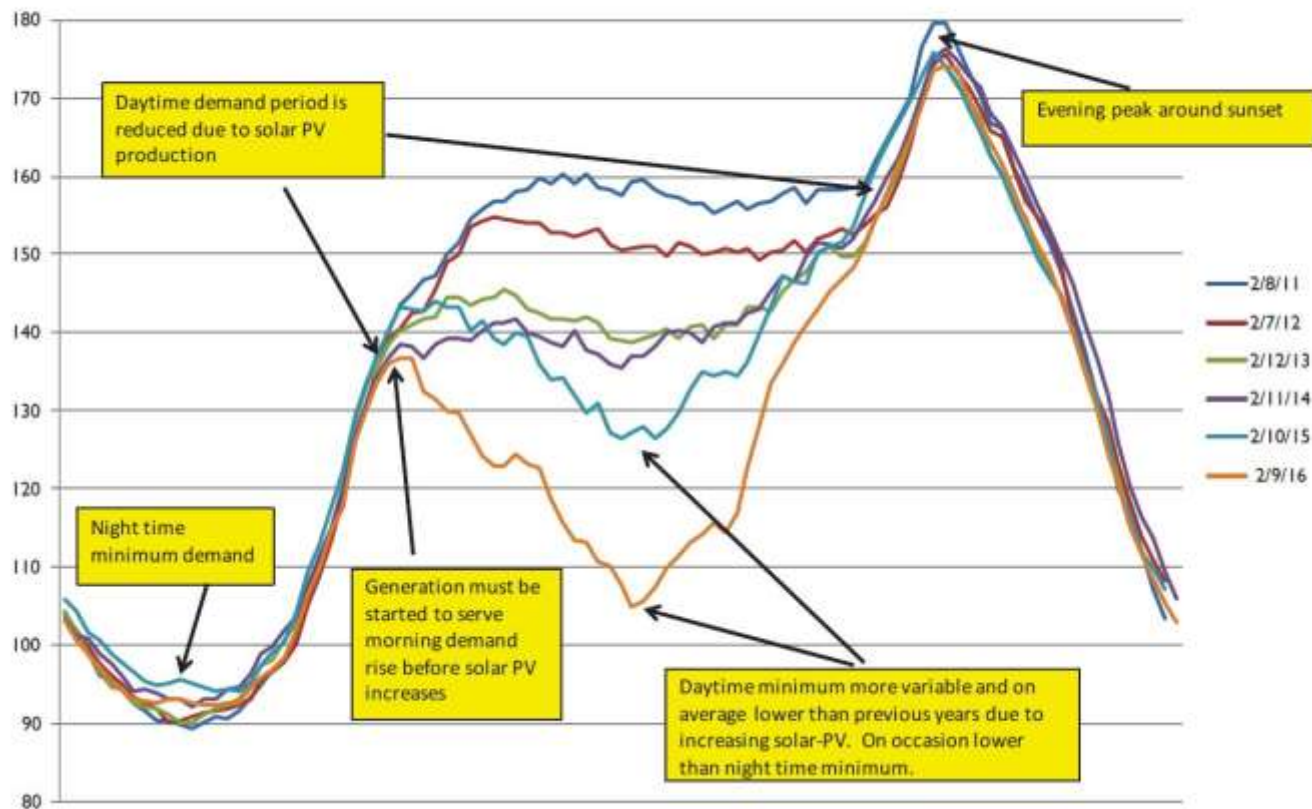


Source: Hawaii PUC 2018 RPS Report



Typical Daily Load Profile 2011-2016

Hawai'i Electric Light Historical Comparison of System Load
Tuesday, Second Week of February

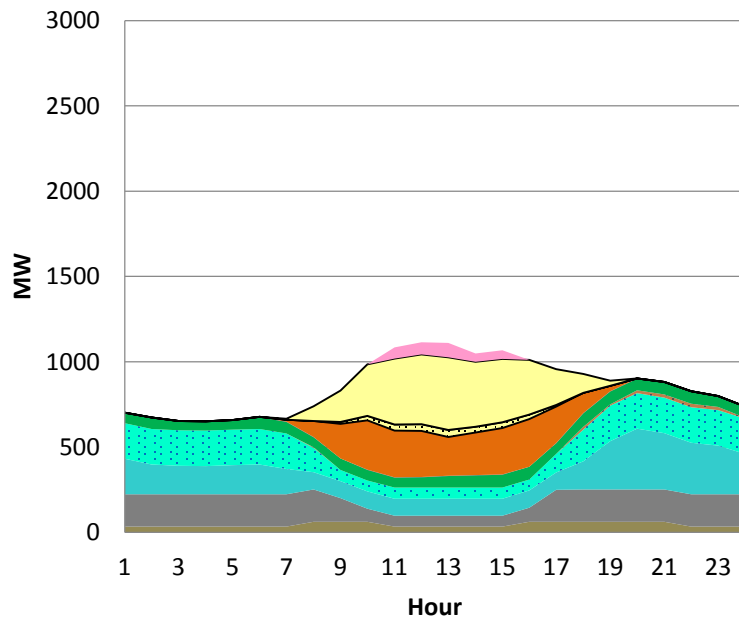


Source: Hawaiian Electric 2016 PSIP Update



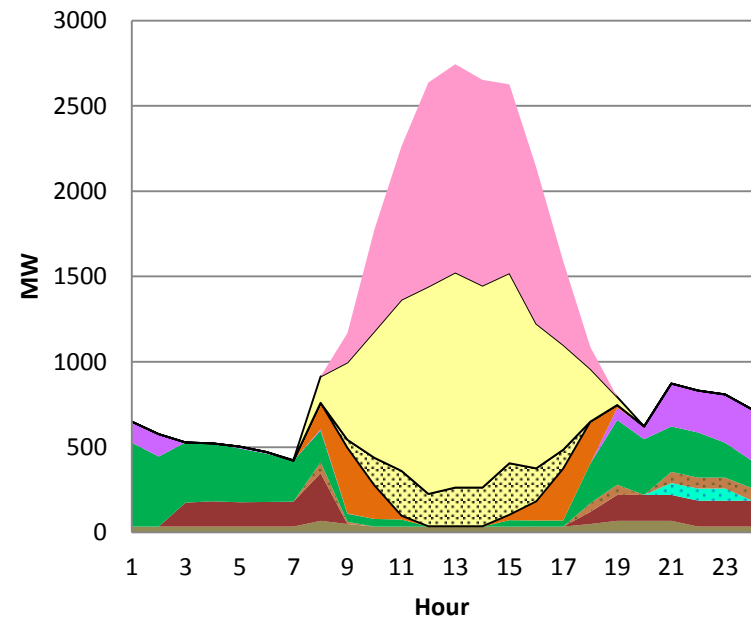
Daily Load Profiles in 2020 and 2045

Energy Profile for 6/14/2020



- H-Power
- New Units
- AES
- Existing Units
- Kalaeloa
- Military Units
- Wind
- Energy Storage
- Other
- Grid-Scale PV
- DG-PV Curtailable
- DG-PV Uncurtailable
- Over-generation

Energy Profile for 3/19/2045



- H-Power
- New Units
- AES
- Existing Units
- Kalaeloa
- Military Units
- Wind
- Energy Storage
- Other
- Grid-Scale PV
- DG-PV Curtailable
- DG-PV Uncurtailable
- Over-generation

Source: Hawaiian Electric 2016 PSIP Update



Major Policy Dockets Before the PUC

Integrated Grid Planning

- Integrated planning process across generation, transmission, and distribution
- Competitive sourcing mechanisms for grid infrastructure and services, including non-wires solutions

Grid Modernization

- Advanced grid technologies to enable DER integration and utilization, including distribution system sensing, communications, automation, control, and metering infrastructure
- PUC approved HECO Grid Modernization project in March 2019

Electrification of Transportation

- HECO Roadmap and associated proposals for advancing electrification of Hawaii's ground transportation
- Includes proposals for make-ready infrastructure and an e-Bus rate design

Competitive Procurement

- PUC approved 6 solar + storage projects totaling nearly 250 MW and 1,000 MWh of storage
- Additional solicitations for grid services from distributed energy resources, including frequency response, capacity, and regulation services

Distributed Energy Resources

- Interconnection requirements for DER, including advanced inverter functions
- New tariff options and market-based procurements (e.g., Smart Export, DR Portfolio) for customers to deliver energy and other services (e.g., frequency response) to the grid, alongside dynamic rate designs (e.g., time-of-use)

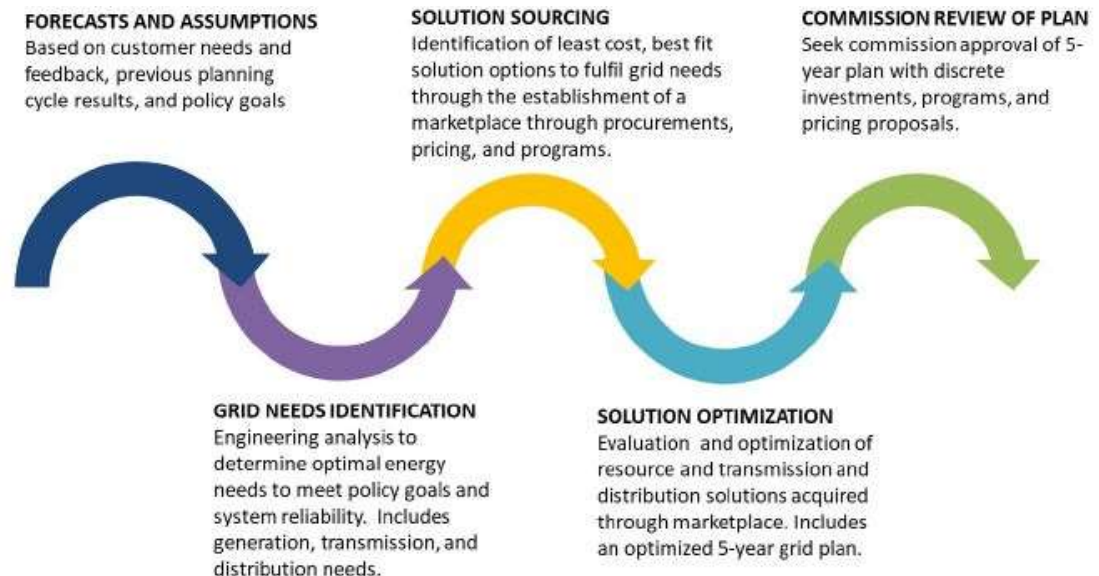
Performance Based Regulation

- Phase 1: Evaluating regulatory framework to reduce customer bills, increase renewable energy, and improve customer service; finished in May 2019
- Phase 2: designing and implementing new PBR mechanisms, began in June 2019

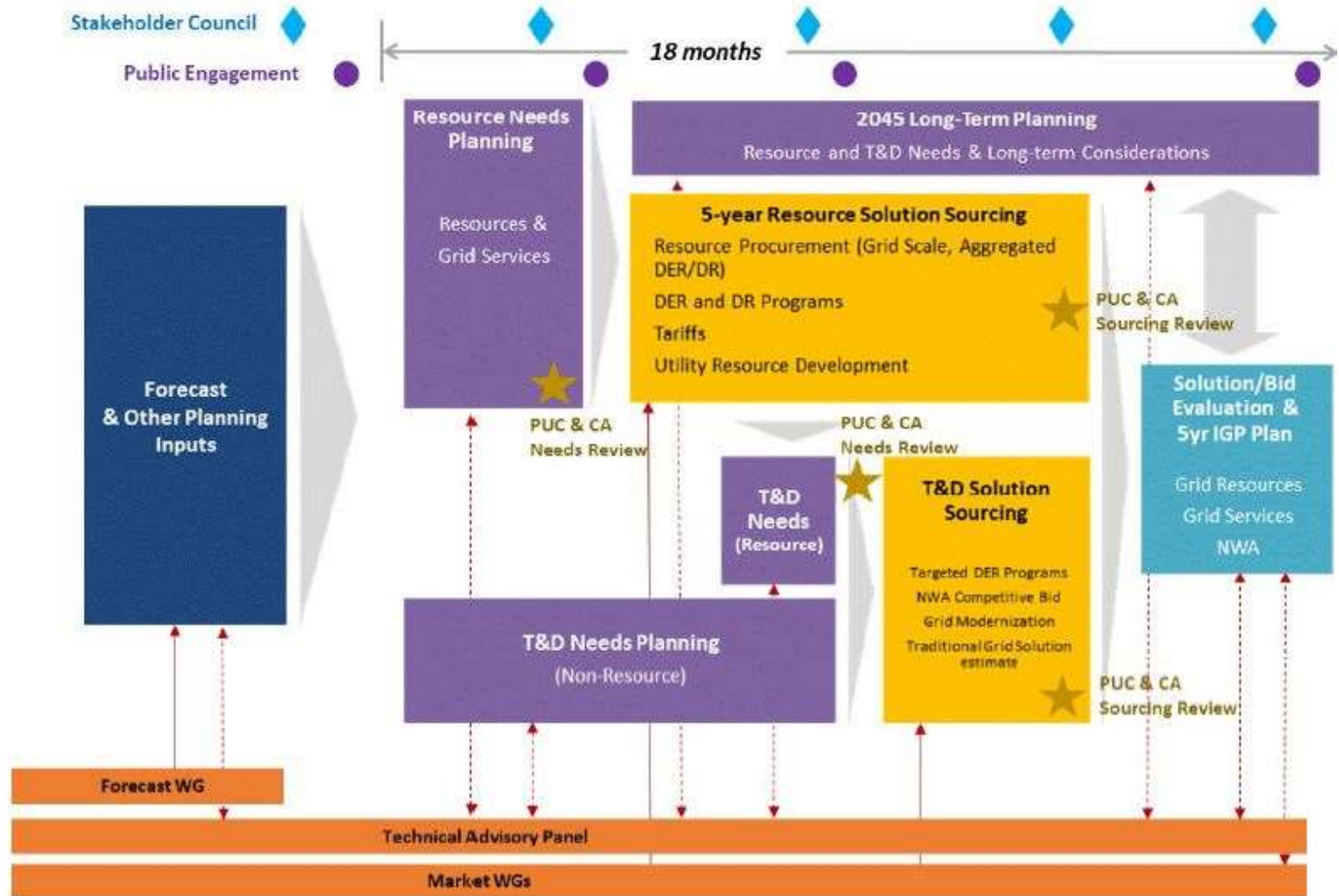


Integrated Grid Planning

- Integrate planning for needs at all levels of power system: bulk power generation, transmission, and distribution, including customer-sited resources
- Goal: identify and procure an optimal mix of distributed and grid scale resources to increase customer value and reduce risk
 - Grid solutions will be identified that address multiple resource, transmission, and distribution needs collectively
 - Market-based procurements incorporated into planning process
- Active engagement with customers, stakeholders, independent technical advisors, and regulators at key junctures is essential to the integrated planning effort
- 18-month planning process intended to result in a 5 year integrated plan

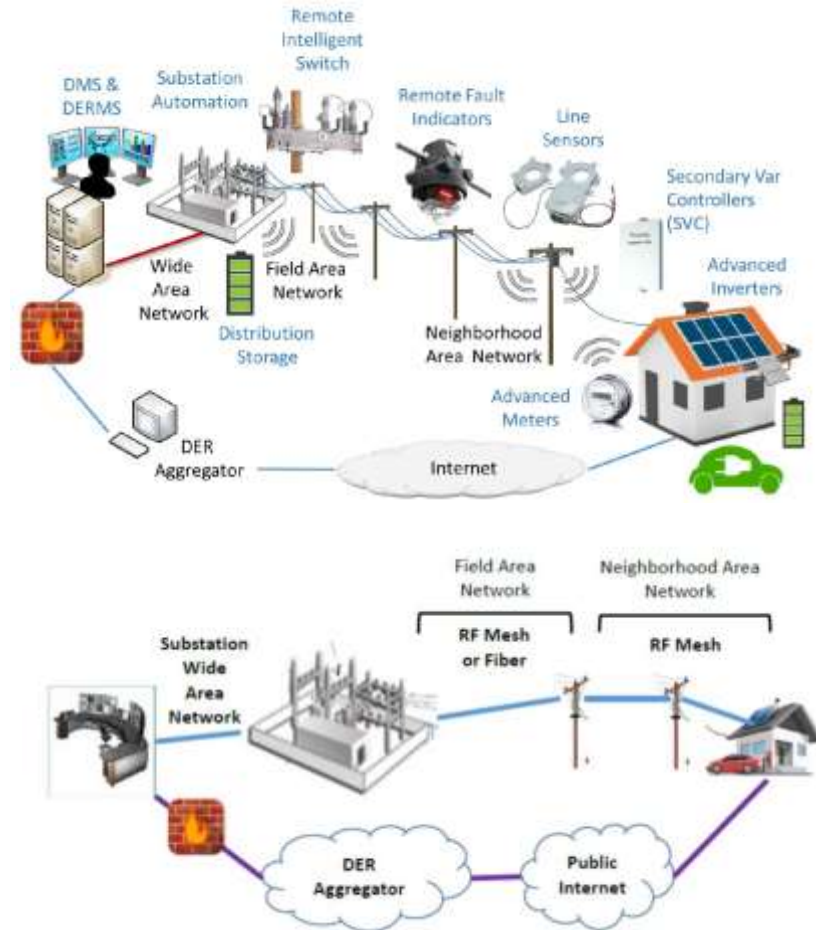


Integrated Grid Planning



Grid Modernization Essential to Integrating Additional Renewables

- PUC Approved HECO Companies Phase 1 Grid Modernization Project in March 2019
- \$86 M investment in advanced grid technologies to enable DER integration and utilization
- Includes distribution system sensing, communications, automation, control, and metering infrastructure
- HECO Companies filed an application in September 2019 for an Advanced Distribution Management System, which is currently under review



Source: HECO Grid Modernization Strategy



Recent Projects Suggest High Levels of RE May Be Possible Sooner

- PUC approved 6 new solar + storage projects for Hawaiian Electric Cos.
 - Totaling nearly 250 MW of generation and 1 GWh of storage
 - Across Oahu, Maui, and Hawaii islands
- KIUC announced it has passed 50% renewable generation with its latest solar + storage project
 - Anticipate achieving more than 70% renewable by as early as 2020



JANUARY 4, 2019 SOLAR-PLUS-STORAGE

Hawaiian Electric Announces 'Mind-Blowing' Solar-Plus-Storage Contracts

by Emma Foehringer Merchant

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Source: Greentech Media 1/4/19



Demand Side Resources Critical for Cost-effective Grid Integration

- Demand side of the equation is a critical part of achieving broader policy objectives, especially as we progress closer towards 100% renewable
 - Includes energy efficiency, distributed storage, flexible/controllable demand, electric vehicles, etc.
- Increasingly, Hawaii will rely on “supply” from demand-side resources, which limits the usefulness of the distinction going forward
- In addition to about 3,000 MW of new utility-scale renewable generation, HECO’s plans by 2045 include:

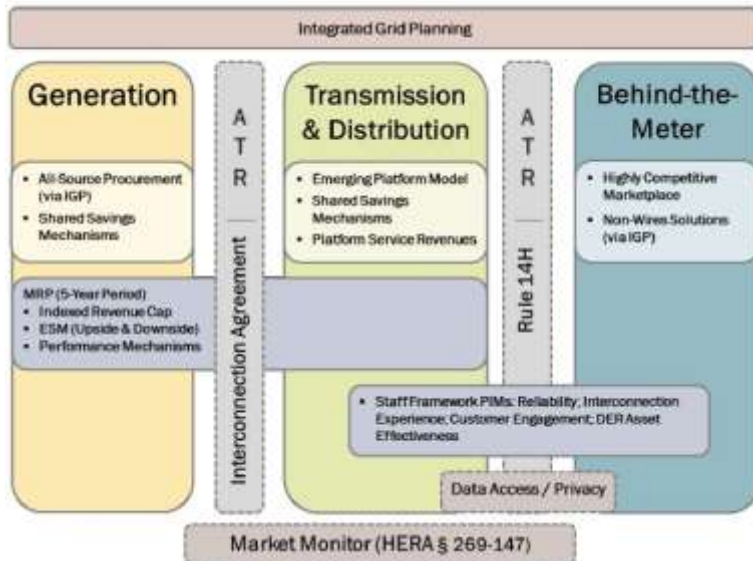
December 2016 PSIP Projections	2017-2021	2022-2045
New DG-PV	326 MW	2,086 MW
New Customer Self Supply (CSS) Energy Storage	89 MW-hr.	1,057 MW-hr.
New Demand Response Capacity	115 MW	442 MW
New Demand Response Energy Storage	104 MW-hr.	1,608 MW-hr.

Source: Hawaiian Electric Grid Modernization Strategy



Performance Based Regulation

- PUC opened investigation in April 2018
- Two phase process to evaluate and update regulatory framework in light of transforming power system
- Phase 1: opportunities to reduce customer bills, increase renewable energy, and improve customer service – finished in May 2019
- Phase 2: design and implementation of new regulatory mechanisms identified in Phase 1 – began in June 2019



Goal	Regulatory Outcome	
Enhance Customer Experience	Traditional	Affordability
		Reliability
	Emergent	Interconnection Experience
		Customer Engagement
Improve Utility Performance	Traditional	Cost Control
	Emergent	DER Asset Effectiveness
		Grid Investment Efficiency
Advance Societal Outcomes	Traditional	Capital Formation
		Customer Equity
	Emergent	GHG Reduction
		Electrification of Transportation
		Resilience



Mahalo!

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