Regulations Driving Hawaii's Energy Transission





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NO TRANSMISSION – NO TRANSITION! 21ST CENTURY T&D SYSTEMS FOR NET ZERO

ACEF 2023 DEEP DIVE WORKSHOP

ADB HEADQUARTERNS; PHILIPPINES

Hawaii's Early Energy Transformation Policies

INITIAL DRIVERS 2015 - • Act 97 - HCEI Agreement 2012 Revised RPS by - Act 155 Portfolio Standards (RPS & EEPS) • Act 89, Act 168 Clarifies adding a 70% by 2011 EV incentives, i.e., 2040; and 100% Decoupling Docket exemptions from parking by 2045 to the 2010 Utility is able to fees and high occupancy State's RPS Act 73 Created recoup losses due to 2009 vehicle lane restrictions requirements \$1.05 "Barrel efficiency measures Act 155 revised Act 97, Act 193 Permits 2008 Tax" for HCEI even if sales decline RPS to 25% by geothermal resource HCEI Agreement • Act 10 Clarifies RPS 2020, 30% by development on state **USDOE-State of** includes RE 2030; created lands; exempts Hawaii-Hawaiian delivered to utility **EEPS (4300** geothermal exploration Electric Company from customer sited from EA/EIS GWh reduction grid connected by 2030); allowed requirements systems EPC contracting, public building **Regulatory Proceedings** benchmarking HECO Feed-in Tariff (opened in 2008) • HECO Rule 14H (opened in 2010)

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• Implementation of Reliability Standards (opened in 2011)

Integrated Resource Planning (opened in 2012)

Integrated Grid Planning (opened in 2018)

Renewable Energy Tax Incentives

Tax credits:

- A dollar-for-dollar reduction in the amount of income tax you would otherwise owe
- Kind of like an IRS gift card



Federal

- Renewable Electricity Production Tax Credit (PTC)
- Energy Investment Tax Credit (ITC)
- Residential Energy Credit
- Modified Accelerated Cost-Recovery System (MACRS)

State (State of Hawaii)

Renewable Energy Technologies
Income Tax Credit (RETITC)

Local

 City and County of Honolulu -Real Property Tax Exemption for Alternative Energy Improvements

Integrated Grid Planning Process



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Framework for Competitive Bidding



- In December 2006, the PUC approved in its Decision and Order No. 23121 (Docket No. 03-0372) the *Framework for Competitive Bidding* as the required mechanism for acquiring or building new generation capacity in Hawaii.
- Competitive bidding facilitates wholesale market competition, enhances the potential for higher efficiency and lower costs, and provides a level playing field on which all generation options can compete.
- Applies to electric utilities under the PUC's jurisdiction.

Available at https://dms.puc.hawaii.gov/dms/DocumentViewer?pid=A1001001A09F09B75438C99058

Approved By Regulators

Name	Island	Developer	Tech	Size	Estimated Completion
AES Kuihelani	Maui (Central Maui)	AES Corporation	Solar + BESS	60 MW, 240 MWh (BESS)	10/2023
AES West Oahu Solar, LLC	Oahu (West Oahu)	AES Corporation	Solar + BESS	12.5 MW, 50 MWh (BESS)	7/2023
Hale Kuawehi Solar LLC	Hawaii Island (Waimea)	Innergex Renewable Energy Inc.	Solar + BESS	30 MW, 120 MWh (BESS)	2024
Hoohana Solar 1, LLC	Oahu (Kunia)	Hanwha Energy USA Holdings Corp (174 Power Global)	Solar + BESS	52 MW, 208 MWh (BESS)	2024
Kapolei Energy Storage	Oahu (Barbers Pt Harbor)	Plus Power LLC	BESS	185 MW, 565 MWh	6/2023
Kupono Solar	Oahu (Ewa)	Kupono Solar Development Company, LLC	Solar + BESS	42 MW, 168 MWh (BESS)	2024
Mountain View Solar	Oahu (Waianae)	AES Corporation	Solar + BESS	7 MW, 35 MWh (BESS)	2024
Paeahu Solar LLC	Maui (Wailea)	Innergex Renewable Energy Inc.	Solar + BESS	15 MW, 60 MWh (BESS)	2025
Puna Geothermal Venture	Hawaii Island (Puna)	Ormat Technologies Inc.	Geothermal	46 MW	2026
Waiawa Phase 2 Solar	Oahu (Waiawa)	AES Corporation	Solar + BESS	30 MW, 240 MWh (BESS)	2024

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IEEE Interconnection Standards Industry Best Practices



- Technology of rotating generation (fossil fuel, hydro, biomass, geothermal) has not changed much for many years
- However, there have been many lessons learned and technology improvements in inverter-based resources (e.g., solar PV, wind, BESS)
- Updating interconnection standards (i.e., Distribution level grid codes) for distributed solar was a <u>first</u> <u>priority</u> as feeder penetration levels quickly outpaced the technical requirements addressed in IEEE 1547-2003
 - The IEEE 1547-2018 update incorporated many of the lessons learned from Hawaii and California operating experience
- Penetration levels of inverter-based resources were also growing quickly on bulk power systems. Existing performance requirements at the transmission level were proving to be inadequate as well.
 - A new standard, IEEE 2800-2022, was recently released to standardize interconnection requirements for inverter-based resources connected to the bulk transmission grid.





Marc M. Matsuura Sr. Smart Grid Program Manager





Mr. Matsuura joined the Hawai'i Natural Energy Institute (HNEI), University of Hawai'i at Mānoa, in 2013 as its Senior Smart Grid Program Manager. He is a founding member of HNEI's Grid*START* (Grid System Technologies Advanced Research Team), a team of professionals focused on energy transition enabling policy and regulation, advanced grid architectures, grid modernization technologies, and novel methods to achieve the reliable grid integration of RE resources, power system optimization and energy resilience goals.

Prior to joining HNEI, he was with the Hawaiian Electric Company for 21 years. His career at Hawaiian Electric included positions of leadership in the areas of transmission and distribution (T&D) engineering, T&D standards and technical services, system operation, transmission planning, smart grid planning, and system integration. Marc is a licensed professional electrical engineer in Hawaii. He holds a B.S. in Electrical Engineering and an M.B.A. from the University of Hawai'i at Mānoa.