Hawai‘i State Energy Office

Hawaii’s Energy Transition Framework: Binding Commitments and Stakeholder Alliance

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Hawai‘i Chief Energy Officer
April 27, 2023

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Our statutory purpose is to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient, clean energy economy.

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Hawai‘i Revised Statutes §269-92 Renewable Portfolio Standards (2015, 2022*)

(a) Each electric utility company that sells electricity for consumption in the State shall establish a renewable portfolio standard of:

(1) 10% of its net electricity sales by December 31, 2010;

(2) 15% of its net electricity sales by December 31, 2015;

(3) 30% of its net electricity sales by December 31, 2020;

(4) 40% of its net electricity [~~sales~~] generation by December 31, 2030;

(5) 70% of its net electricity [~~sales~~] generation by December 31, 2040; and

(6) 100% of its net electricity [~~sales~~] generation by December 31, 2045.

*Act 240 (2022) changed the RPS standard from net sales to generation. This presentation will present progress based on net sales while generation data are being updated.

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Hawai‘i Revised Statutes §225P-5, Zero Emissions Clean Economy Target (2018, 2022*)

(a) Considering both atmospheric carbon and greenhouse gas emissions as well as offsets from the local sequestration of atmospheric carbon and greenhouse gases through long-term sinks and reservoirs, a statewide target is hereby established to **sequester more** atmospheric **carbon and greenhouse gases than emitted** within the State **as quickly as practicable, but no later than 2045**[.]; provided that the statewide target includes a greenhouse gas emissions limit, to be achieved **no later than 2030, of at least fifty per cent below** the level of the statewide greenhouse gas emissions in **2005**.

*Act 238 (2022) added an interim 2030 greenhouse gas emissions target using a new baseline of 2005 instead of 1990.

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Energy transition drivers in Hawai‘i

- Oil Shock - Recession
- Sense of Urgency / Public Will to Act
- Bipartisan Collaboration

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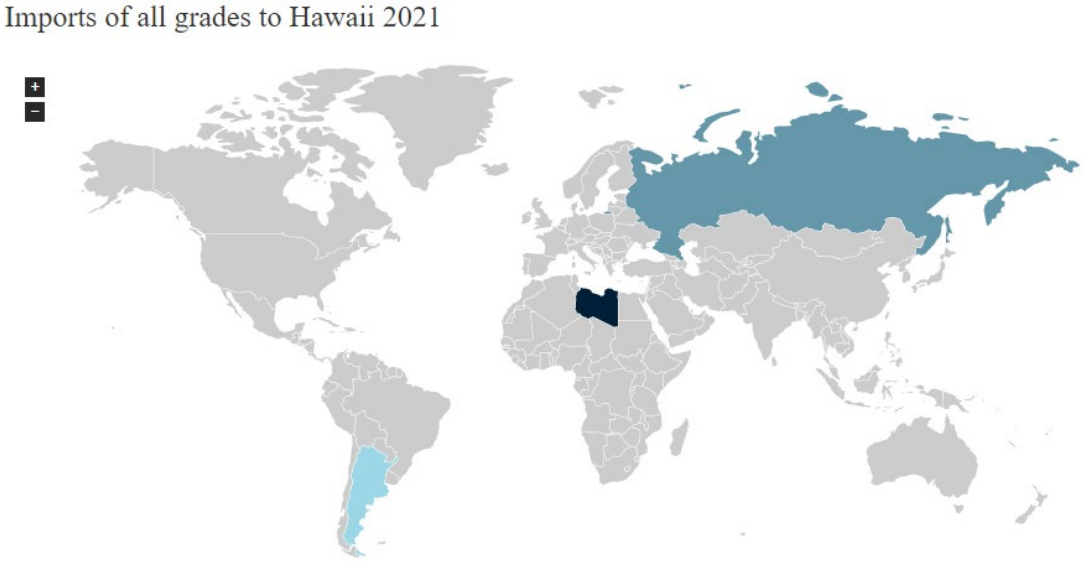

Petroleum imports to Hawai‘i in 2021

Libya – 64%
Russia – 28%
Argentina – 8%

Imports by Country June 2022

In response to the war in Ukraine in April 2022, Hawai‘i’s only refinery announced suspension of Russian crude oil purchase. Imports shifting to Argentina and Libya.

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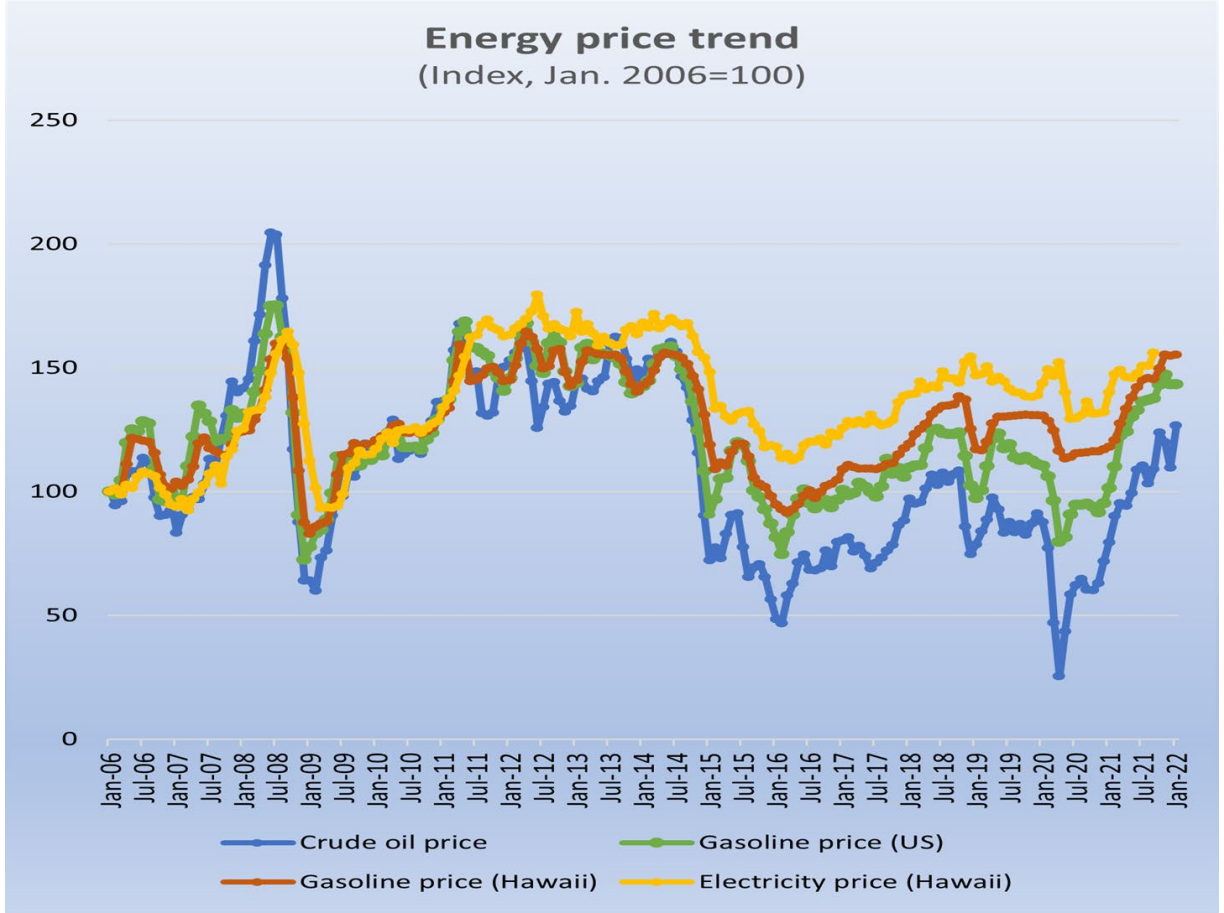
Oil Volatility in Hawai‘i



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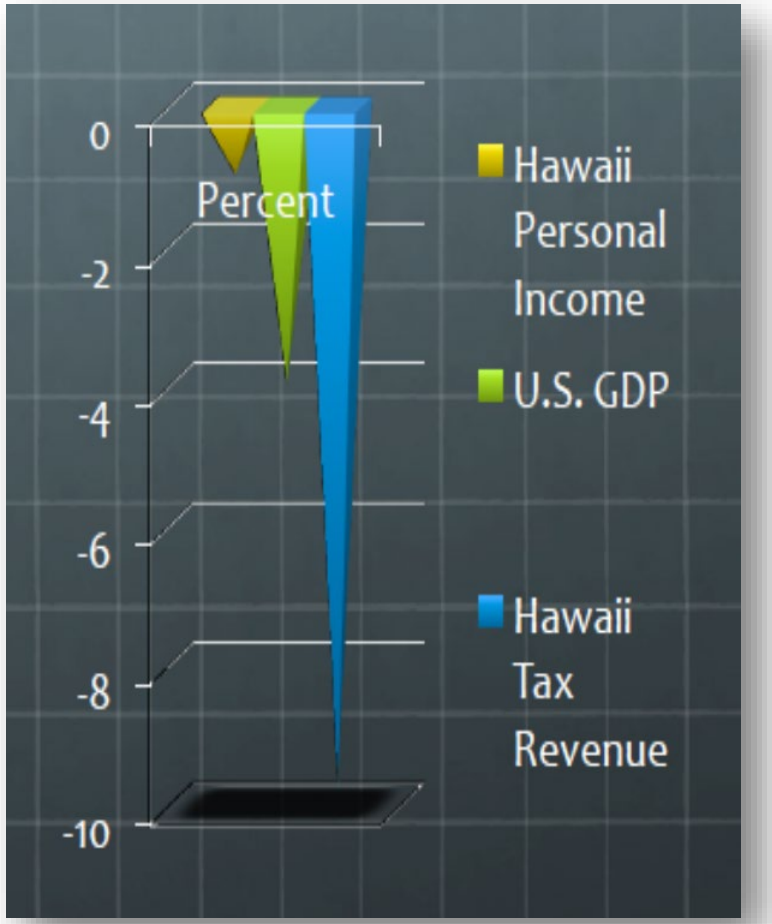
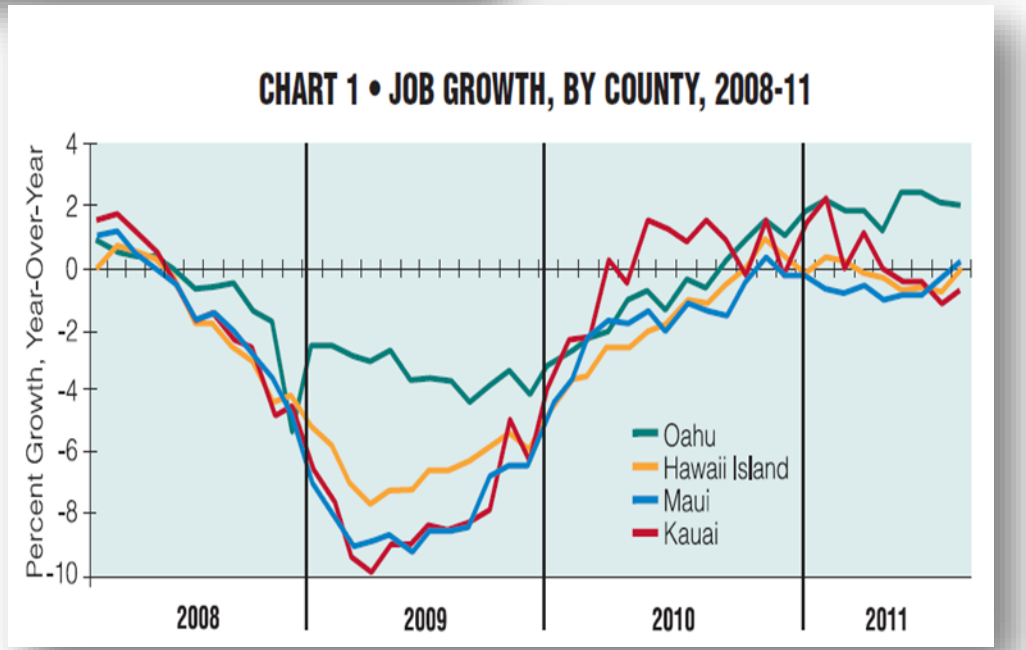
Hawai‘i’s economic recession 2008-9

Decline in Hawaii and U. S. Economy and Hawaii Tax Revenues FY 2009

Freefall in tax revenue and job growth





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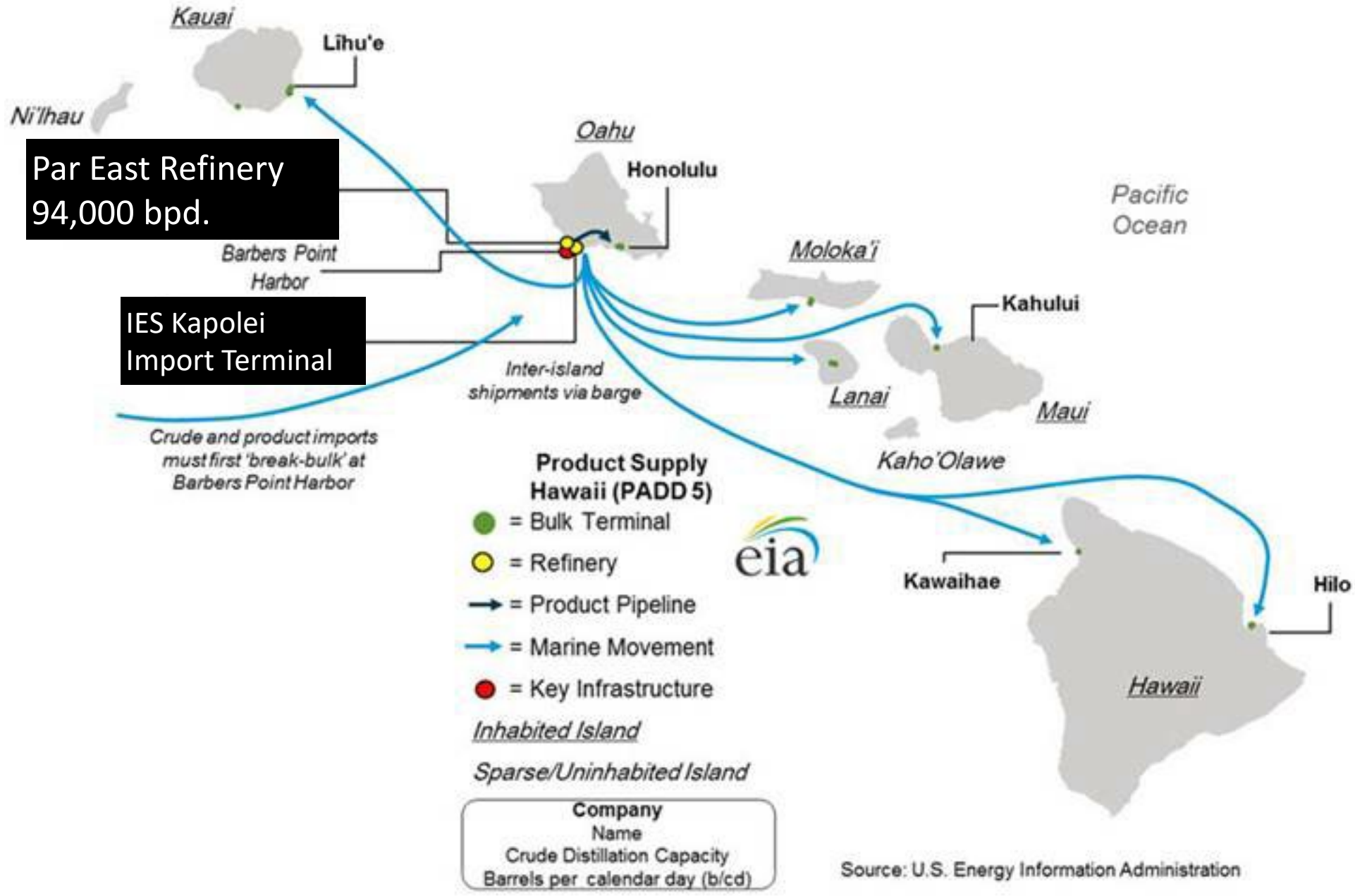
Supply Chain Vulnerabilities



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Hawai'i Powered

Hawai'i Clean Energy Initiative

An energy transformation partnership

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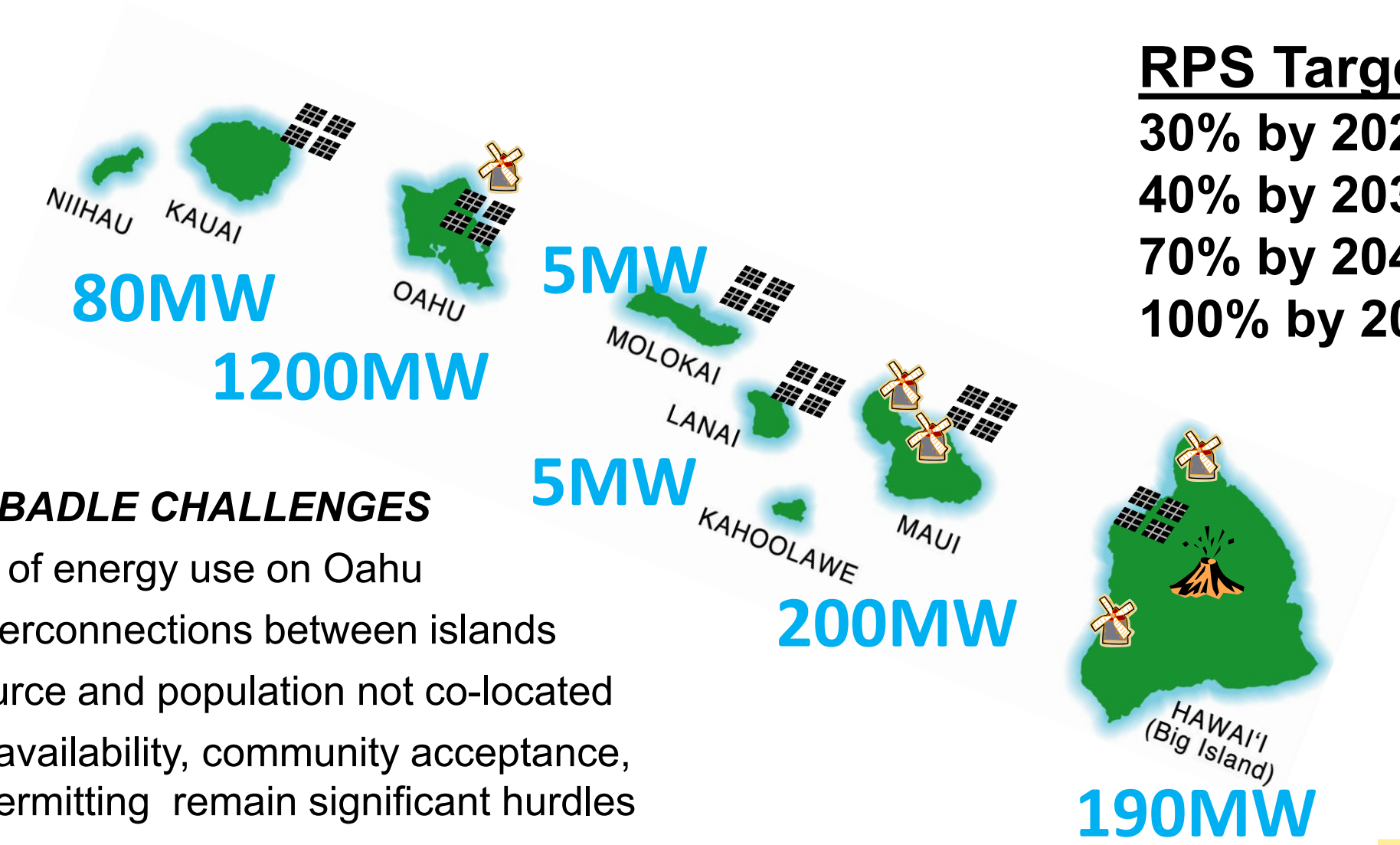
Affecting Change on Six Isolated Grids



RPS Targets

30% by 2020
40% by 2030
70% by 2040
100% by 2045

FORMIBADLE CHALLENGES

- >70% of energy use on Oahu
- No interconnections between islands
- Resource and population not co-located
- Land availability, community acceptance, and permitting remain significant hurdles

Meeting RPS goals requires innovation and community commitment

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100% by 2045

- Under Act 97 Hawaii is the first state to set a 100% RPS.
- A binding commitment for renewable energy establishes confidence in the market that drives investment decisions.

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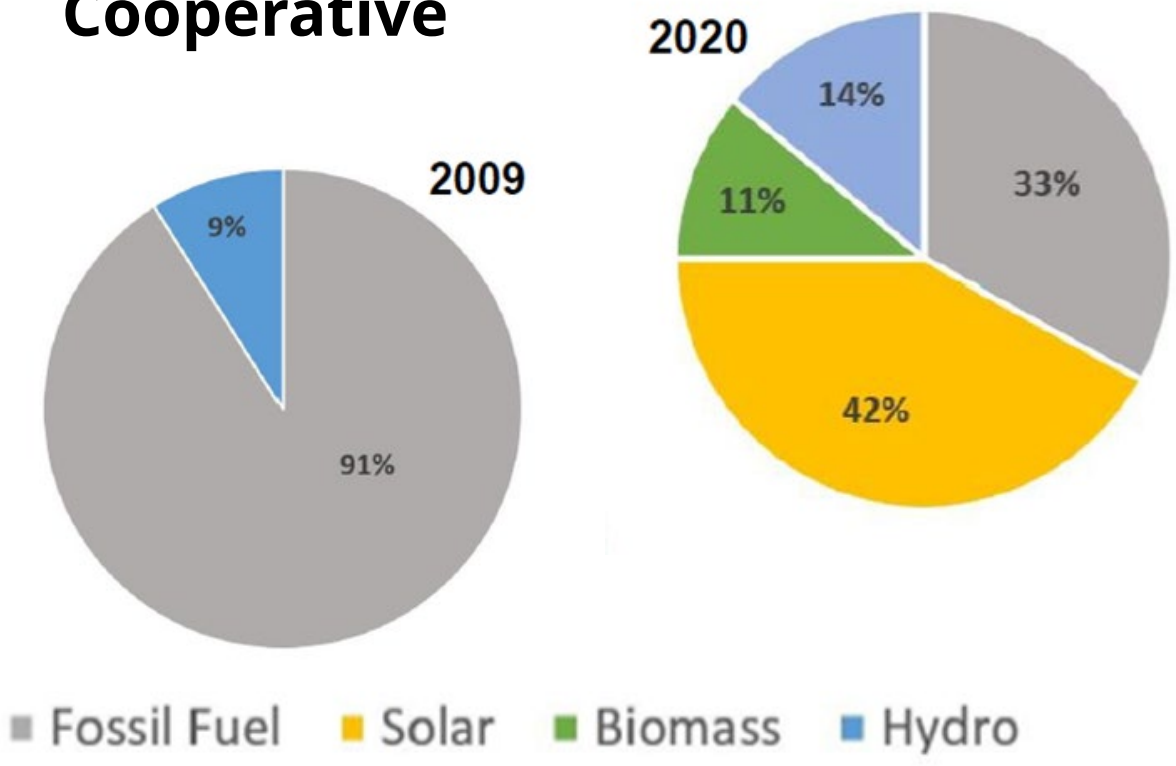
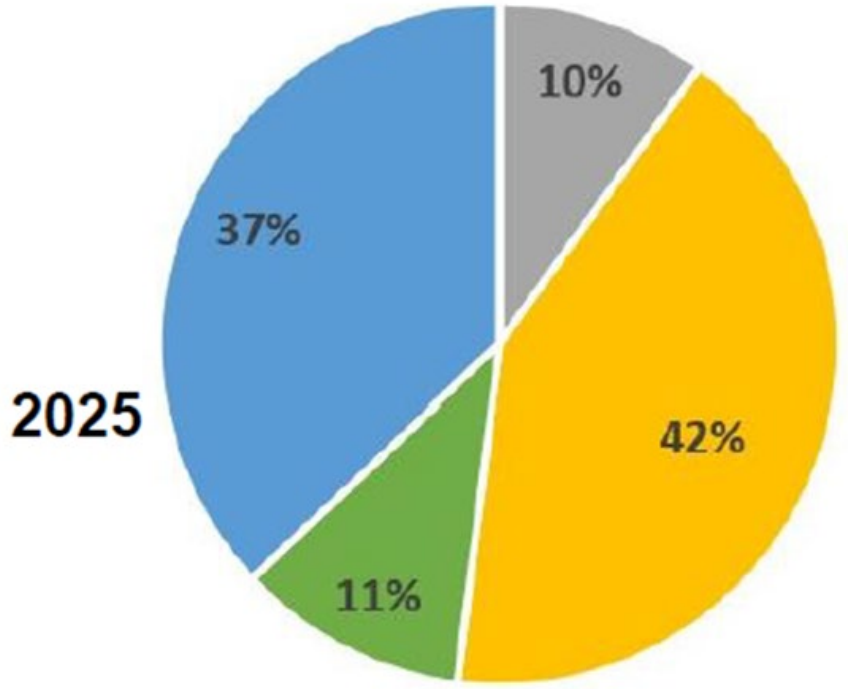
RPS Progress and Future*

Kaua‘i Island Electric Cooperative





Source: KIUC WEKP Presentation

* Assumes projects in development are not delayed past 2025

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Project name	Island	Developer	Size	Storage	Cost per KWh
Waikoloa Solar	Hawaii	AES	30 MW	120 MWh	$0.08
Hale Kuawehi	Hawaii	Innergex	30 MW	120 MWh	$0.09
Kuihelani Solar	Maui	AES	60 MW	240 MWh	$0.08
Paeahu Solar	Maui	Innergex	15 MW	60 MWh	$0.12
Hoohana	Oahu	174 Power Global	52 MW	208 MWh	$0.10
Mililani I Solar	Oahu	Clearway	39 MW	156 MWh	$0.09
Waiawa Solar	Oahu	Clearway	36 MW	144 MWh	$0.10

Fuel oil has ranged in past 5 years from **$0.14** to **$0.25 per KWh**

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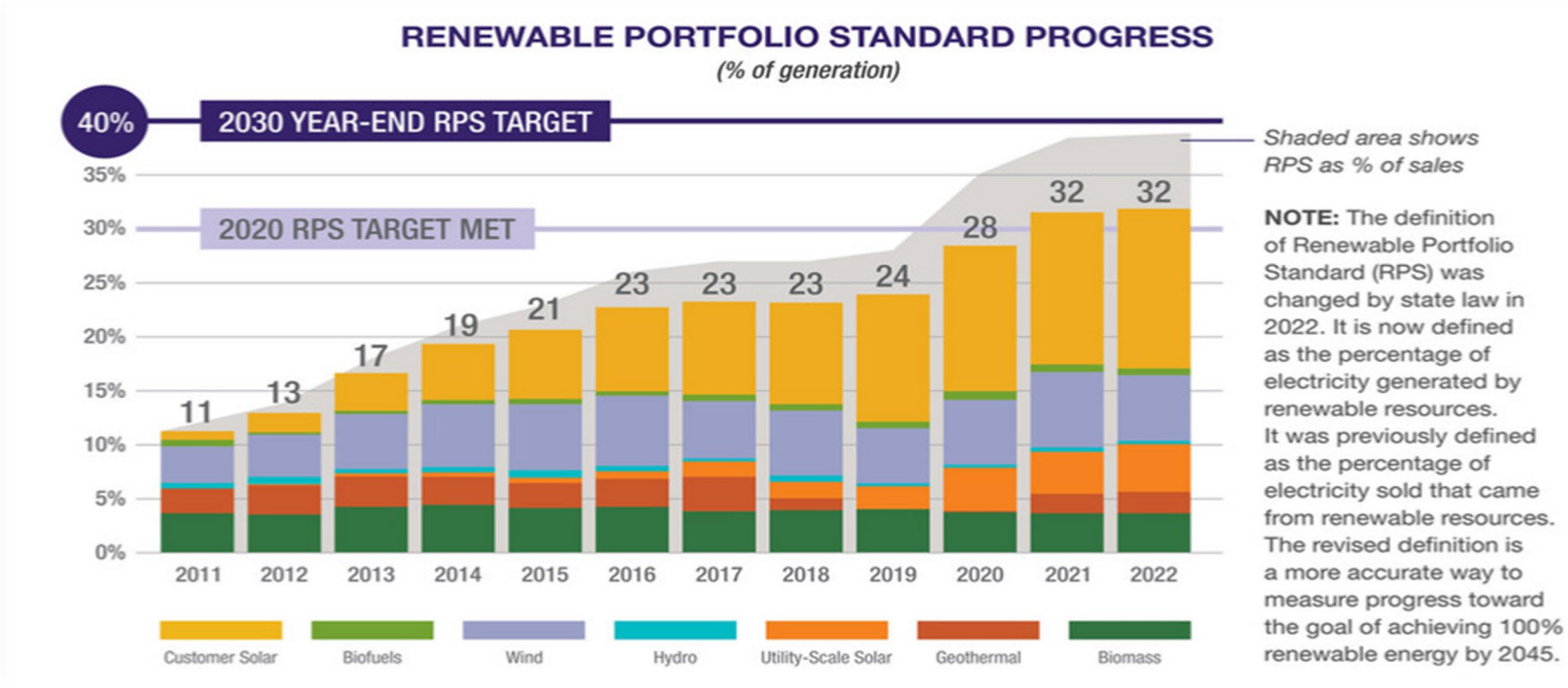

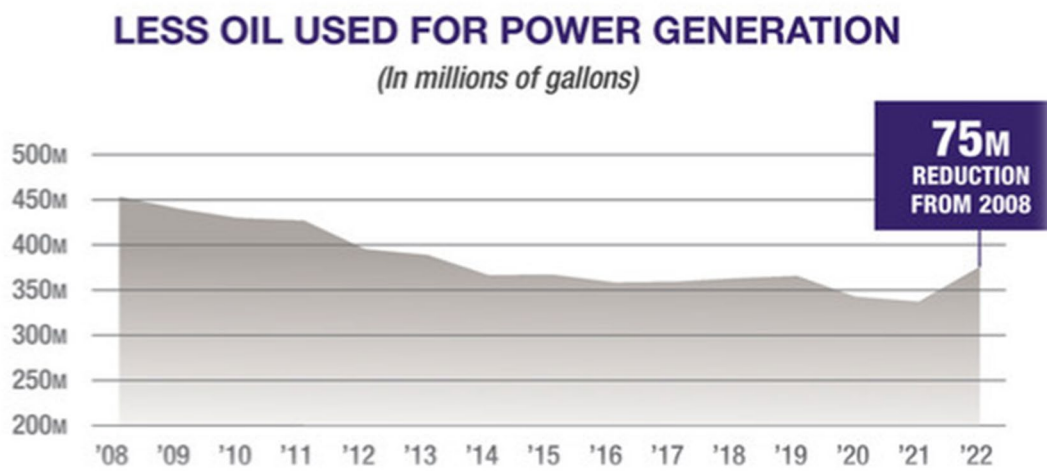

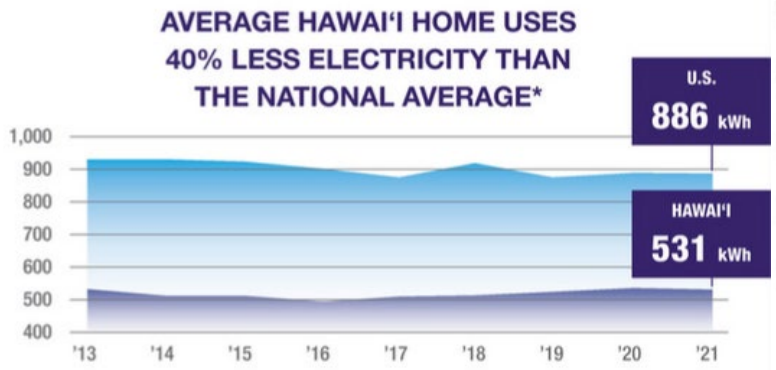

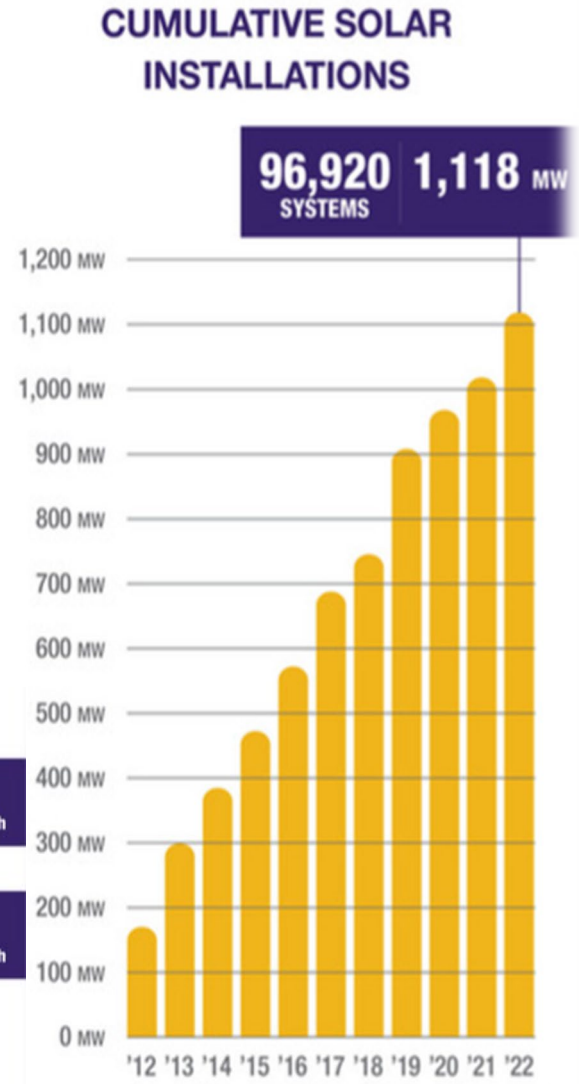

Source: Hawaiian Electric Sustainability Report 2022-2023

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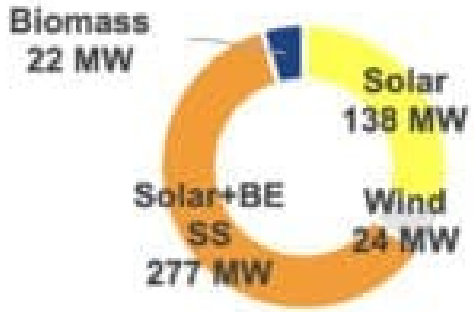
Renewable energy projects—status update

Near-term renewable projects represent diverse resource mix, contribute significantly to RPS

Near term (2019 – 2022) projects by technology (MW)[1,2]



Near term (2019 – 2022) projects by status (MW)[1,2]

Near term projects, % RPS contribution by year[3]

Community acceptance of projects, land availability and market's ability to deliver cost-effective projects are key determinants of reaching up to 50% RPS

Note: Megawatts shown in charts at top of slide do not translate directly to RPS percentage points, as capacity factors of each technology must be factored in to get to RPS contribution.

1 Megawatts exclude BESS portion of Solar+BESS projects, which are tracked in megawatt-hours rather than megawatts.

2 Excludes RFP Stage 2.

3 Puna Geothermal Venture ("PGV") was damaged by lava flows in 2018; timing for its return to service is currently uncertain. 50% RPS by 2022 assumes both PGV and Hu Honua are placed in service.

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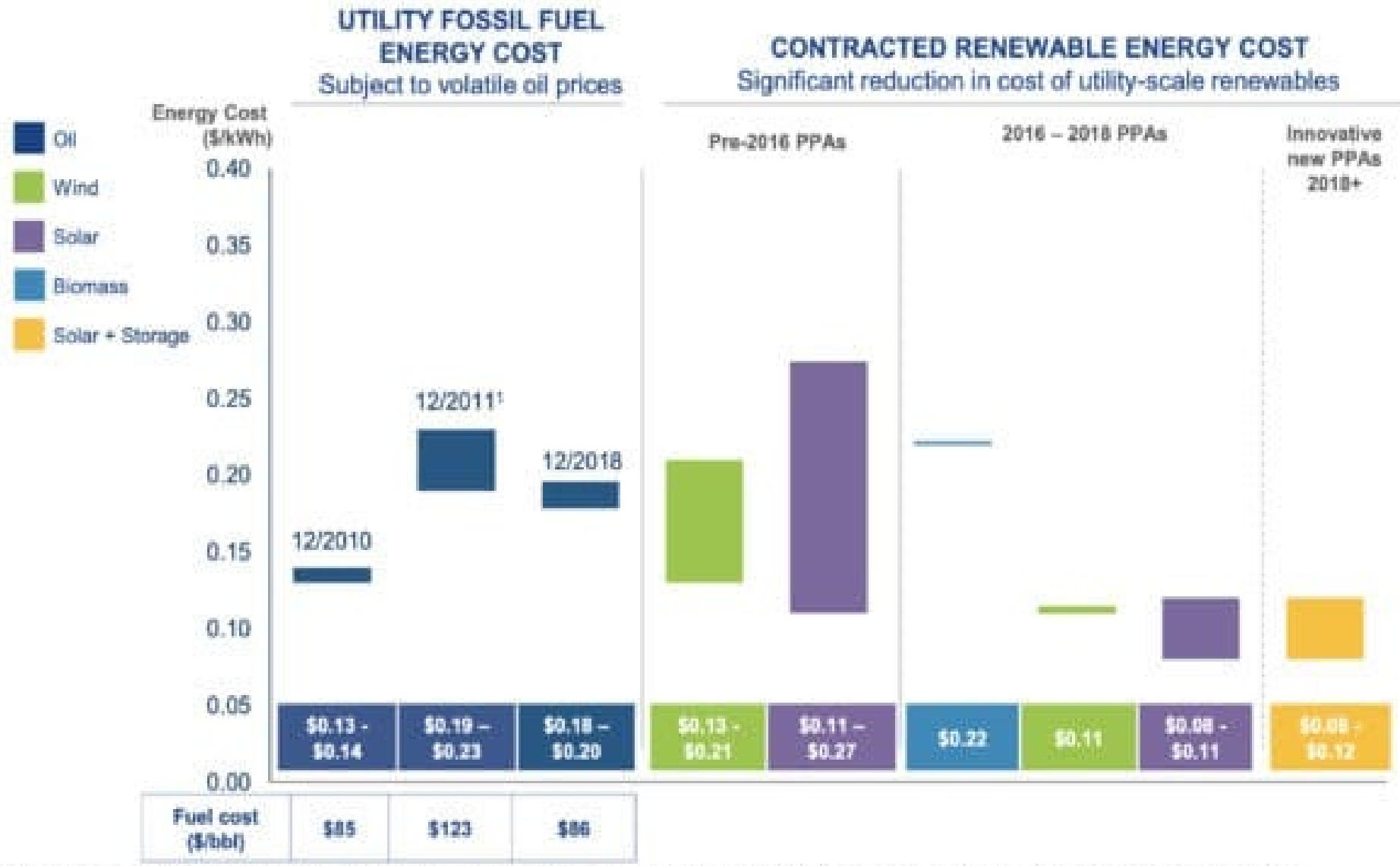
Renewable energy is key to customer affordability in Hawaii



1. The 2011 fuel oil increase was largely driven by the nuclear disaster of the Fukushima power plant in March 2011, which increased the price of oil in Hawaii as our fuel oil purchases are largely driven by the Asia Pacific market.

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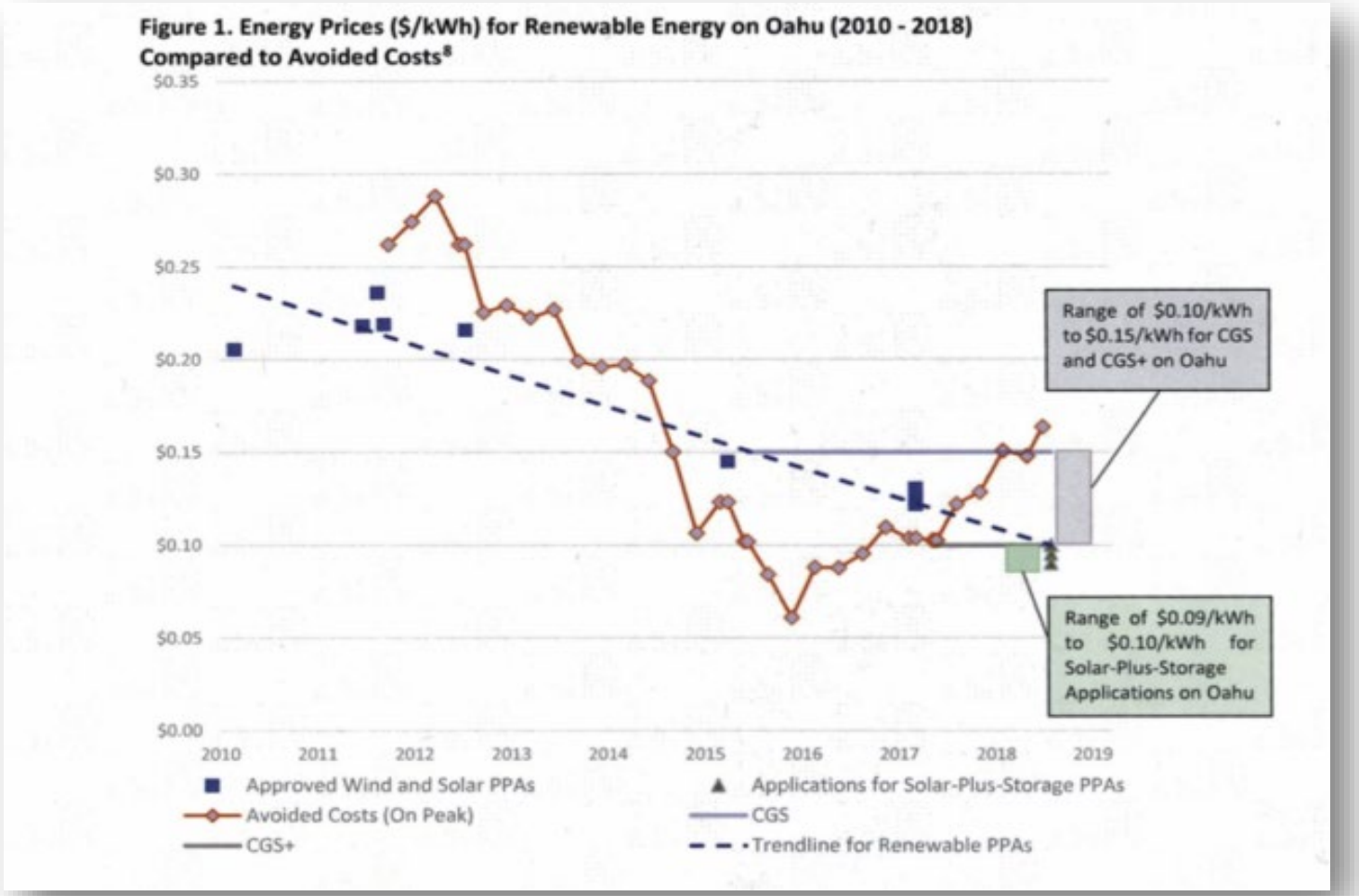
Avoided Cost of Fuel-Oil v. Renewable Electricity

Source: Civil Beat



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Mahalo for your time!

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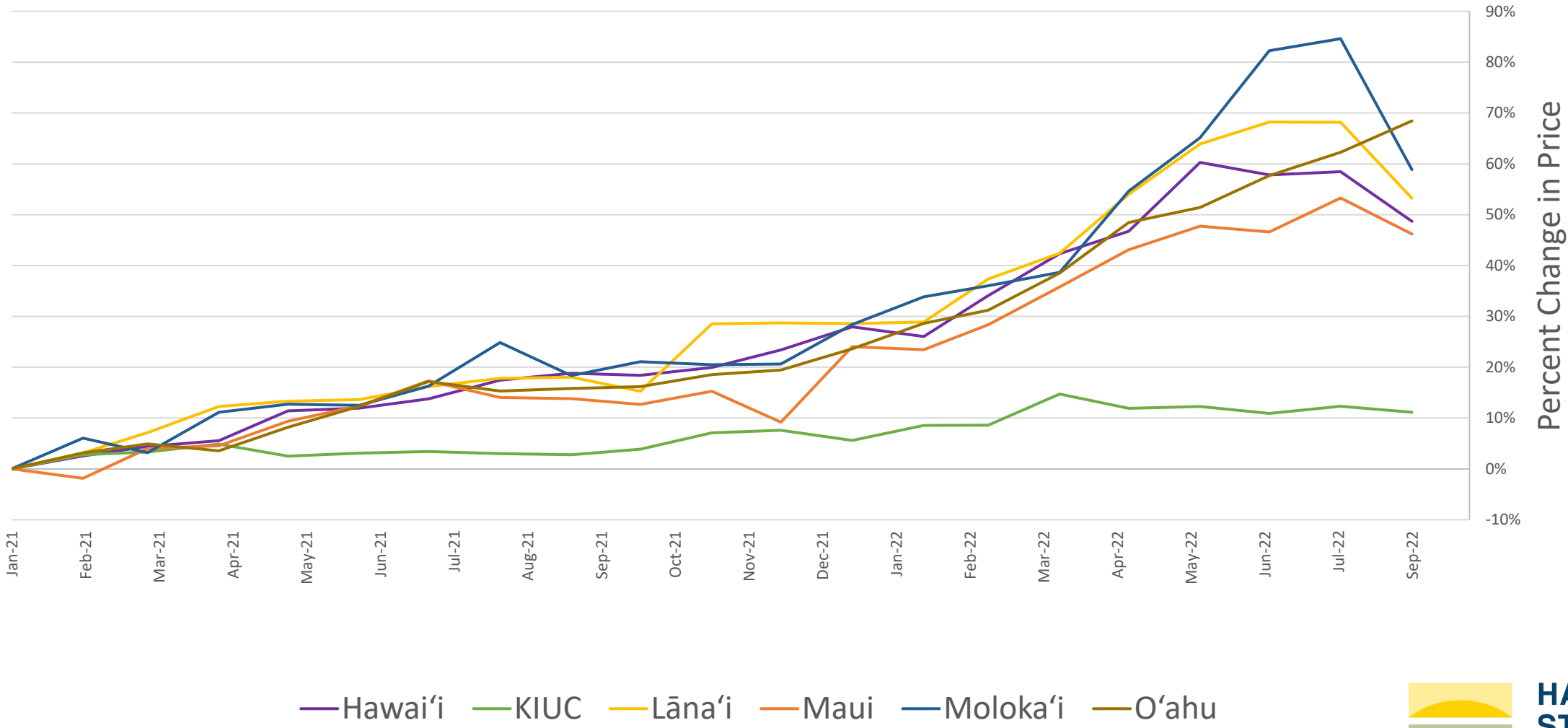
Percentage Change in Electricity Price, All Sectors
January 2021 Baseline Year



Baseline Month-Year: January 2021. Data Source – Utility Rate Reports; Hat tip – Olin Lagon

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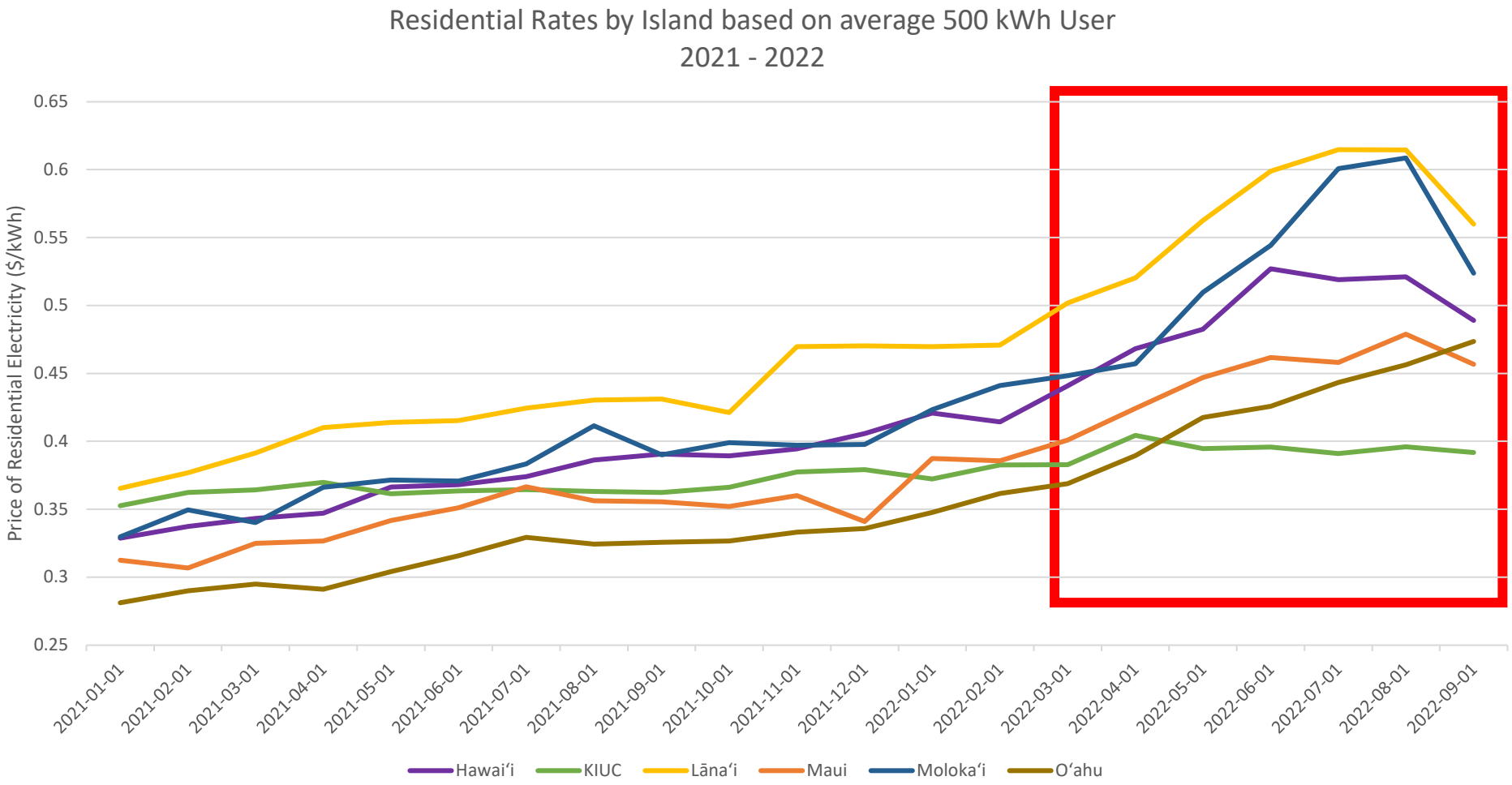
Average Electricity Prices by Island – 2021 to 2022



War in Ukraine increases oil prices April 2022

O‘ahu costs exceed Kaua‘i energy costs

Kaua‘i energy costs plateau.

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