JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

STATE OF HAWAII | KA MOKUʻĀINA ʻO HAWAIʻI
OFFICE OF THE DIRECTOR
DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS
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NADINE Y. ANDO
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DEAN I HAZAMA
DEPUTY DIRECTOR | KA HOPE LUNA HOʻOKELE

Testimony of the Department of Commerce and Consumer Affairs

Before the
House Committee on Energy & Environmental Protection
Tuesday, March 18, 2025
10:45 a.m.
Conference Room 325

On the following measure:
H.C.R. 58 / H.R. 54, REQUESTING THE HAWAII STATE ENERGY OFFICE TO CONVENE A GEOTHERMAL ENERGY WORKING GROUP TO EVALUATE THE REGULATORY AND POLICY LANDSCAPE SURROUNDING GEOTHERMAL ENERGY IN HAWAII

Chair Lowen and Members of the Committee:

My name is Michael Angelo, and I am the Executive Director of the Department of Commerce and Consumer Affairs (Department) Division of Consumer Advocacy. The Department provides comments on this resolution.

The purpose of this resolution is to request that the Hawaii State Energy Office (HSEO) convene a Geothermal Energy Working Group (Working Group) to evaluate the regulatory and policy landscape surrounding geothermal energy in Hawaii. In addition, the Working Group is requested to: (1) identify key regulatory, policy, and permitting challenges affecting geothermal energy in Hawaii; (2) review best practices from other jurisdictions with successful geothermal energy programs and consider best practices of Pacific island countries such as New Zealand; (3) assess the potential for geothermal expansion and its role in supporting energy resilience and affordability; and (4) provide

recommendations to the Legislature and Governor on policy and regulatory reforms necessary establish a clear and efficient pathway for geothermal energy in Hawaii. Furthermore, HSEO is requested to submit a report of its findings and recommendations, including any proposed legislation, to the Legislature no later than 20 days prior to the convening of the Regular Session of 2026.

The Department appreciates the resolution's intent to advance the State's commitment of achieving 100% renewable energy portfolio standards by 2045 and the recognition that work towards this commitment needs to be accelerated. As stated in the resolution, the Department also views geothermal energy as a form of firm renewable energy resource that can help provide grid stability. The Department also agrees that the development of geothermal energy in the State would be assisted by reviewing and investigating, among other things, methods and processes to establish efficient pathways to advance geothermal energy in the State. The Department's Division of Consumer Advocacy is statutorily mandated to represent, protect, and advance the interests of all consumers of utility services. Accordingly, the Department respectfully recommends that page 3 of this measure be amended to include the "Executive Director of the Division of Consumer Advocacy of the Department of Commerce and Consumer Affairs, or the Executive Director's designee," as a member of the Working Group.

Thank you for the opportunity to testify on this resolution.

JOSH GREEN, M.D.
GOVERNOR
STATE OF HAWAII
Ke Kia'āina o ka Moku'āina 'o Hawai'i

SYLVIA J. LUKE
LT. GOVERNOR
STATE OF HAWAII
Ka Hope Kia'āina o ka Moku'āina 'o Hawai'i

KALI WATSON
CHAIRPERSON, HHC
Ka Luna Ho'okele

KATIE L. LAMBERT
DEPUTY TO THE CHAIR
Ka Hope Luna Ho'okele

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
Ka 'Oihana 'Āina Ho'opulapula Hawai'i
P. O. BOX 1879
HONOLULU, HAWAII 96805

TESTIMONY OF KALI WATSON, CHAIR
HAWAIIAN HOMES COMMISSION
BEFORE THE HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION
HEARING ON MARCH 18, 2025 AT 10:45AM IN CR 325

HR 54 / HCR 58

March 17, 2025

Aloha Chair Lowen, Vice Chair Perruso, and Members of the Committee:

The Department of Hawaiian Home Lands (DHHL) **supports** this resolution requesting the Hawaii State Energy Office to convene a Geothermal Energy Working Group to evaluate the regulatory and policy landscape surrounding geothermal energy in Hawai'i.

The Hawaiian Homes Commission requested that a permitted interaction group (P.I.G.) be established to study, evaluate, and recommend strategies related to geothermal exploration, feasibility, extraction, and/or use on Hawaiian Home Lands. DHHL is pursuing a multi-faceted approach to achieve its objectives, collaborating with the Hawaii State Energy Office (SEO) and the University of Hawaii's School of Ocean and Earth Science and Technology, specifically the Hawaii Institute of Geophysics and Planetology's Hawaii Groundwater and Geothermal Resources Center (HGGRC). DHHL has met with staff from the Hawaii Congressional Delegation and the U.S. Department of Energy (DOE). Additionally, the National Renewable Energy Laboratory (NREL), under contract with the US DOE's Geothermal Technologies Office, is conducting community-based listening sessions across the state, in which DHHL has been actively involved. DHHL believes this resolution establishes a step in the right direction toward the necessary and continued collaboration of the noted stakeholders and representatives.

Thank you for your consideration of our testimony.

DEPARTMENT OF HAWAIIAN HOME LANDS

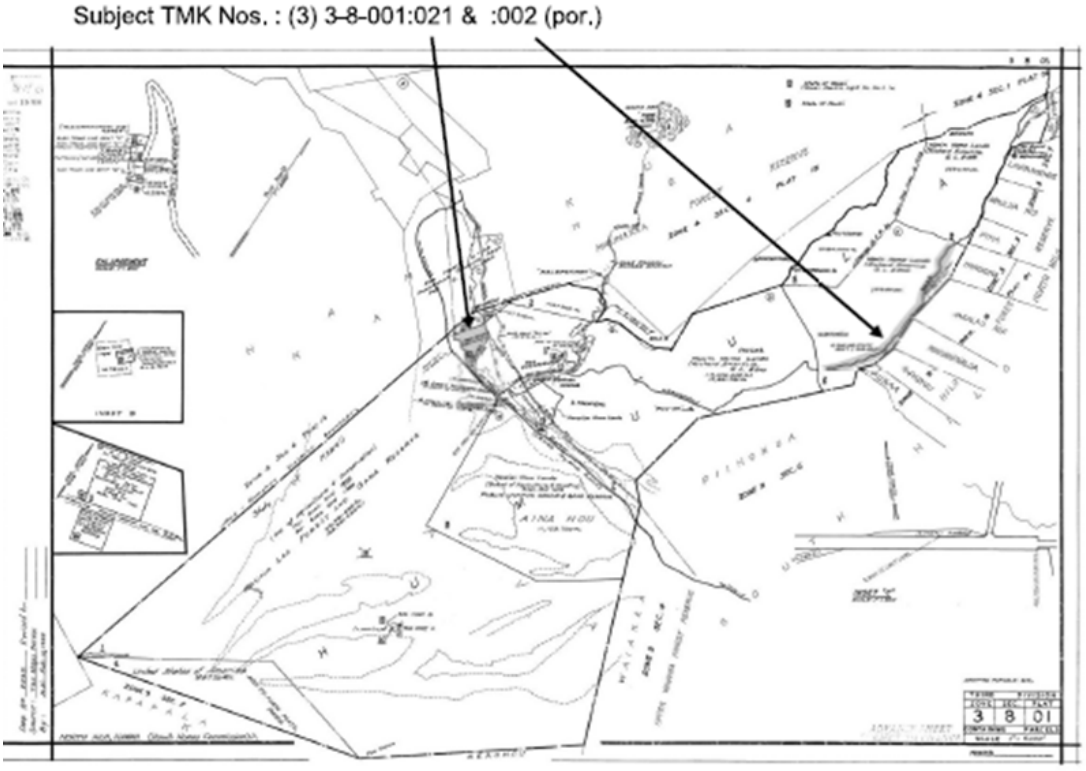
Geothermal Development Project

Summary
The Hawaii Department of Hawaiian Home Lands (DHHL), under the governance of the Hawaiian Homes Commission, through its Geothermal Permitted Interaction Group, continues to investigate the viability of geothermal production on Hawaiian Home Lands. The main sites under current consideration are on Hawaii Island: Humuʻula, Kawaihae, and South Point (Kaʻū). Humuʻula is the preferred development site, located directly next to lands leased by the Department of Defense for the Pōhakuloa Training Area.

DHHL is pursuing a multi-faceted approach to achieve its objectives, collaborating with the Hawaii State Energy Office (SEO) and the University of Hawaii's School of Ocean and Earth Science and Technology, specifically the Hawaii Institute of Geophysics and Planetology's Hawaii Groundwater and Geothermal Resources Center (HGGRC). DHHL has met with staff from the Hawaii Congressional Delegation and the U.S. Department of Energy (DOE). Additionally, the National Renewable Energy Laboratory (NREL), under contract with the US DOE's Geothermal Technologies Office, is conducting community-based listening sessions across the state, in which DHHL has been actively involved.

As this represents DHHL's initial effort to commercialize its geothermal resources, the Department continuously seeks guidance from geothermal specialists to assist in its mission. DHHL recognizes that establishing commercial energy projects is complex and capital-intensive. Therefore, the Department is exploring funding opportunities at both federal and state levels and seeking private industry partners who can facilitate third-party investments in a public-private partnership (PPP) to develop and operate the project.

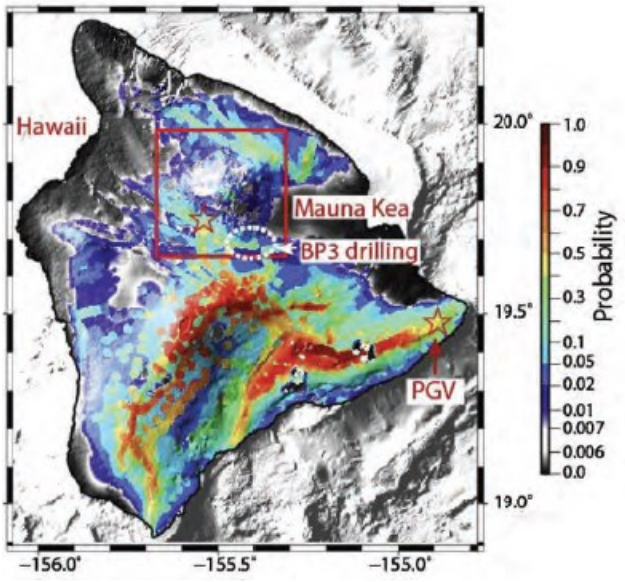
Recently, DHHL collaborated with HGGRC to have magnetotelluric (MT) testing and data collection take place at multiple sites within the DHHL's lands at Humuʻula and on the East Flank of Mauna Kea (see map below). This MT testing will further confirm or disprove the respective sites' suitability for geothermal power production. If this MT testing produces positive results, DHHL will move forward to financing and conducting exploratory slim-hole drilling. This step is crucial for further establishing the viability of the chosen site(s) for commercial geothermal production. The collected data will facilitate entering into a PPP with an experienced geothermal developer/operator.



Next Steps
The aforementioned MT testing on DHHL's lands commenced in October 2024. Contingent on securing funding, DHHL would like to commence slim-hole water well drilling in 2025.

State and Federal Policy and Funding
State: DHHL will request $20,000,000 in the state fiscal year 2025-2026 to develop slim-hole water wells for geophysical investigation, exploration, and identification of geothermal resources on Hawaiian home lands.

Federal: DHHL is considering policy proposals for submission to the Hawaii Congressional Delegation and is exploring USDOE funding opportunities to conduct MT testing and slim-hole water well drilling on various DHHL properties. In the long term, DHHL estimates that up to $200M of non-competitive federal funding is ultimately needed: (i) to determine which DHHL site(s) provides the "best" opportunity for commercial production of geothermal power, and (ii) to position such site(s) for PPP development.



Resource probability map for Hawaii Island. Red box outlines area of geophysical surveying. Stars indicate a Saddle Drill site where high temperatures were found (north) and Hawaii's only geothermal production site Puna Geothermal Venture (south)(Lautze et al., 2020)

Other Information

Findings from the December 9, 2016, geothermal investigation suggest the following:

- Information found to date at the DHHL sites investigated supports the elements required for a blind (no surface features) geothermal system to exist are present
- Further exploration is needed to determine if the elements combine sufficiently to create a viable geothermal resource at depth
- Blind, high enthalpy systems do exist in volcanic settings elsewhere globally
- Analysis of the PTA-1 core log from 1,000m showed zones of highly fractured rock & geothermal fluid-rock interaction occurred in the core
- Same core section saw a temperature increase from 40° C - 140°C (104°F - 284°F)
- Important information on 2 key control variables for the geothermal resource. Relevant for "ground-truthing" the apparent resistivity values from the Magnetotelluric (MT) survey
- Additional testing & exploration are needed to justify any exploration drilling (slim hole) at sites
- Sufficient information to warrant & justify moving forward to undertake further MT surveys to create a robust 3D subsurface model at a number of potential locations

Hydrothermally altered ground at Kilauea. Various alteration clays, discharging steam, silica residue, sulphur vents and areas of bare ground all indicate the presence of a subsurface steam zone.

Image by Gary Smith

HAWAII STATE ENERGY OFFICE
STATE OF HAWAII

JOSH GREEN, M.D.
GOVERNOR

SYLVIA LUKE
LT. GOVERNOR

MARK B. GLICK
CHIEF ENERGY OFFICER

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Testimony of
MARK B. GLICK, Chief Energy Officer

before the
HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION

Tuesday, March 18, 2025
10:45 AM
State Capitol, Conference Room 325 and Videoconference

Providing Comments on
HR 54

REQUESTING THE HAWAII STATE ENERGY OFFICE TO CONVENE A GEOTHERMAL ENERGY WORKING GROUP TO EVALUATE THE REGULATORY AND POLICY LANDSCAPE SURROUNDING GEOTHERMAL ENERGY IN HAWAII.

Chair Lowen, Vice Chair Perruso, and Members of the Committee, the Hawai‘i State Energy Office (HSEO) respectfully provides comments on HR 54 that requests HSEO to convene a geothermal energy working group to evaluate regulatory and policy landscape surrounding geothermal energy in Hawai‘i.

The state’s energy transition to 100% RPS by 2045 will require more than the intermittent sources of energy that solar and wind provide. Firm and dispatchable resources, such as geothermal, are paramount to our energy reliability and grid stability. Geothermal energy has the potential to have a transformative effect on Hawai‘i’s energy ecosystem.

Potential roadblocks to advancing geothermal energy development include 1) a lack of data on the geothermal and groundwater resources (resource potential) that exist, as well as uncertainty regarding the regulatory conditions for the permitting and construction of a new geothermal energy production plant. Relating to the understanding of resource potential, in 2024, Governor Josh Green, M.D., allocated $5 million from the Coronavirus State Fiscal Recovery Fund for slim-hole geothermal resource characterization to identify possible locations for viable geothermal energy

deployment. HSEO is working with the University of Hawai‘i’s Groundwater and Geothermal Resource Center (HGGRC) to conduct this resource assessment, building on their research and the existing body of knowledge. However, more funding is needed to determine the resource potential statewide. Relating to the uncertain regulatory conditions, a review of policy and regulations leading to actionable recommendations could make the barrier to geothermal energy production more attainable.

HSEO recognizes that, as stated in the resolution, “a coordinated, transparent, and community-inclusive process is essential to evaluating the role of geothermal energy in Hawai‘i”. Accordingly, HSEO notes that the members listed in the current working group may not adequately represent the Native Hawaiian community. However, HSEO is committed to ensuring that appropriate community organizations are invited to join the working group, as permitted by this resolution.

HSEO emphasizes that a key priority of the State, and a foundation of the working group, should be guided by the understanding of the underlying geothermal resource potential. Given the ongoing resource assessment and its associated timeline, HSEO recommends that this working group be convened over two years instead of one.

Accordingly, HSEO respectfully requests one amendment to the bill on Page 4, line 17, to extend the due date of the report of findings, allowing the work to align more closely with the ongoing resource exploration.

BE IT FURTHER RESOLVED that the Hawaii State Energy Office is requested to submit a report of its findings and recommendations, including any proposed legislation, to the Legislature no later than twenty days prior to the convening of the Regular Session of ~~2026~~ 2027;

This working group could allow HSEO and other stakeholders the ability to find viable solutions for allowing the potential of geothermal energy production to become a larger reality as we move towards our clean energy goals.

Thank you for the opportunity to testify.

JOSH GREEN, M.D.
GOVERNOR

SYLVIA LUKE
LT. GOVERNOR

LEODOLOFF R. ASUNCION, JR.
CHAIR

NAOMI U. KUWAYE
COMMISSIONER

COLIN A. YOST
COMMISSIONER

STATE OF HAWAII
PUBLIC UTILITIES COMMISSION
465 S. KING STREET, #103
HONOLULU, HAWAII 96813

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Website: puc.hawaii.gov
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Testimony of the Public Utilities Commission

To the
House Committee on
Energy and Environmental Protection

March 18, 2025
10:45 a.m.

Chair Lowen, Vice Chair Perruso, and Members of the Committee:

Measure: HCR 58 / HR 54
Title: REQUESTING THE HAWAII STATE ENERGY OFFICE TO CONVENE A GEOTHERMAL ENERGY WORKING GROUP TO EVALUATE THE REGULATORY AND POLICY LANDSCAPE SURROUNDING GEOTHERMAL ENERGY IN HAWAII.

Position:

The Public Utilities Commission ("Commission") supports this resolution and offers the following comments for consideration.

Comments:

The Commission supports the intent of this measure to form a working group that would evaluate the regulatory and policy landscape surrounding geothermal energy in Hawaii.

The Commission recognizes the potential of geothermal energy to support the state's goal of achieving 100% renewable energy by 2045, as well as the importance of considering such potential in a transparent and coordinated manner. The Commission appreciates this resolution's inclusion of Commission staff in its proposed working group and stands ready to participate.

Thank you for the opportunity to testify on this resolution.

Email: communications@ulupono.com

HOUSE COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION
Tuesday, March 18, 2025 — 10:45 a.m.

Ulupono Initiative supports HR 54/HCR 58, Requesting the Hawaii State Energy Office (HSEO) to Convene a Geothermal Energy Working Group to Evaluate the Regulatory and Policy Landscape Surrounding Geothermal Energy in Hawaii.

Dear Chair Lowen and Members of the Committee:

My name is Micah Munekata, and I am the Director of Government Affairs at Ulupono Initiative. We are a Hawai'i-focused impact investment firm that strives to improve the quality of life throughout the islands by helping our communities become more resilient and self-sufficient through locally produced food, renewable energy and clean transportation choices, and better management of freshwater resources.

Ulupono supports HR 54/ HCR 58, which requests that the HSEO convene a working group to evaluate the regulatory and policy landscape surrounding geothermal energy in Hawaii.

Hawaii needs all viable forms of renewable energy to meet the 100% renewable portfolio standard by 2045. New data underscores the widespread support among residents for this transition. Between October 2023 and January 2024, Ulupono Initiative partnered with Anthology Research to conduct a statewide public opinion survey on energy in Hawaii involving 1,985 surveys across all four counties. With a margin of error +/- 2.21%, this is arguably the most extensive and comprehensive study on the topic to date. The findings are compelling.

A staggering 91% of respondents expressed their support for the expansion of renewable energy resources throughout the islands. Moreover, the importance of developing Hawaii's own energy resources was emphasized across all counties by the residents. This resounding endorsement from the community validates the strong support for continued investment and advancement in renewable energy solutions to meet our collective energy goals.

In order to ensure a transparent and responsible state approach, this resolution seeks to convene a working group of energy experts across the public and private sector to pave the way forward for future geothermal energy development throughout the State. Having a coordinated effort across all agencies and stakeholders will be key to the success of any geothermal program. We hope that this working group can allow for all those involved to be aligned and well-equipped with pertinent information and direction.

Thank you for the opportunity to testify.

Respectfully,

Micah Munekata
Director of Government Affairs

Comments before
March 18, 2025 House Committee on
Energy and Environmental Protection

OPPOSING
House Concurrent Resolution 58 and
House Resolution 54
Relating to Geothermal Expansion

Mike Ewall, Esq.
Founder & Executive Director
Energy Justice Network
215-436-9511
mike@energyjustice.net
www.EnergyJustice.net

Aloha Honorable Committee members. Energy Justice Network is a national organization supporting grassroots groups working to transition their communities from polluting and harmful energy and waste management practices to clean energy and zero waste solutions. In Hawai'i, we've been working with residents who first sought our support in 2015. Since mid-2022, we have supported residents in forming the Hawai'i Clean Power Task Force and Kokua na Aina to address numerous energy and waste issues in the state.

Please oppose HCR 58 and HR 54.

Geothermal has consistently ranked among the most expensive forms of electric power production, right up there with trash and tree burning and nuclear power. This is based on the latest data from the U.S. Energy Information Administration.[1] Capital cost and fixed operations and maintenance costs (O&M) are among the most expensive options – far more expensive than using solar with storage to meet firm energy needs.

Case No.	Technology	Description	Net Nominal Capacity (kW)	Net Nominal Heat Rate (Btu/kWh)	Capital Cost ($/kW)	Fixed O&M Cost ($/kW-year)	Variable O&M Cost ($/MWh)	Nitrogen Oxide (NOx) (lb/MMBtu)	Sulfur Dioxide (SO_2) (lb/MMBtu)	Carbon Dioxide (CO_2) (lb/MMBtu)
1	USC Coal without Carbon Capture – Greenfield	1 x 735 MW Gross	650	8,638	$4,103	$61.60	$6.40	0.06	0.09	206
2	USC Coal 95% Carbon Capture	1 x 819 MW Gross	650	12,293	$7,346	$86.70	$13.73	0.06	0.09	10.3
3	Aeroderivative CTs – Simple Cycle	4 x 54 MW Gross	211	9,447	$1,606	$9.56	$5.70	0.0075	0.00	117
4	CTs – Simple Cycle	1 x H-Class	419	9,142	$836	$6.87	$1.24/ MWh, $23,100/ Start	0.0075	0.00	117
5	CC 2x2x1	2 x 1 H Class	1,227	6,266	$868	$12.12	$3.41	0.0075	0.00	117
6	CC 1x1x1, Single Shaft	1 x 1 H Class SS	627	6,226	$921	$15.51	$3.33	0.0075	0.00	117
7	CC 1x1x1, Single Shaft, with 95% Carbon Capture	1 x 1 H Class SS	543	7,239	$2,365	$24.78	$5.05	0.0075	0.00	6
8	Biomass Plant with 95% Carbon Capture	1 x BFB	50	19,965	$12,631	$261.18	$9.65	0.08	<0.03	10.3
9	Advanced Nuclear (Brownfield)	2 x AP1000	2,156	10,608	$7,861	$156.20	$2.52	0	0	0
10	Small Modular Reactor Nuclear Power Plant	6 x 80 MW Small Modular Reactor	480	10,046	$8,936	$121.99	$3.19	0	0	0
11	Geothermal	Binary Cycle	50	N/A	$3,963	$150.60	$0.00	0	0	0
12	Hydroelectric Power Plant	New Stream Reach Development	100	N/A	$7,073	$33.54	$0.00	0	0	0
13	Onshore Wind – Large Plant Footprint: Great Plains Region	200 MW | 2.8 MW WTG	200	N/A	$1,489	$33.06	$0.00	0	0	0
14	Onshore Wind – Repowering/Retrofit	150 MW | 1.5 - 1.62 MW WTG	150	N/A	$1,386	$38.55	$0.00	0	0	0
15	Fixed-bottom Offshore Wind: Monopile Foundations	900 MW | 15 MW WTG	900	N/A	$3,689	$154.00	$0.00	0	0	0
16	Solar PV with Single-Axis Tracking	150 MW_{AC}	150	N/A	$1,502	$20.23	$0.00	0	0	0
17	Solar PV with Single-Axis Tracking and AC-Coupled Battery Storage	150 MW_{AC} Solar 50 MW | 200 MWh Storage	150	N/A	$2,175	$38.39	$0.00	0	0	0
18	Solar PV with Single-Axis Tracking and DC-Coupled Battery Storage	150 MW_{AC} Solar 50 MW | 200 MWh Storage	150	N/A	$2,561	$39.24	$0.00	0	0	0
19	BESS	Lithium Ion, 150 MW | 600 MWh	150	N/A	$1,744, ($436/kWh)	$40.00	$0.00	0	0	0

On top of the high cost to ratepayers are the costs to our environment and the community.

[1] U.S. Energy Information Administration, "Capital Cost and Performance Characteristics for Utility-Scale Electric Power Generating Technologies," January 2024, Table 1-2 (page 24). https://www.eia.gov/analysis/studies/powerplants/capitalcost/pdf/capital_cost_AEO2025.pdf

Geothermal is only used in the state in Puna by Puna Geothermal Ventures (PGV), an Israeli company (Ormat) that has run an inconsistent and harmful operation in Puna with numerous environmental violations. While many support it as a renewable energy source, the lived experience of those living near the facility raises many concerns.

Puna residents have been speaking up for many years with concerns about air releases of hydrogen sulfide and other chemicals brought up in the process (toxic metals, radon...), health impacts when the community has been exposed to these gases, drilling impacts (noise, well blowouts, underground fracturing, not plugging wells), reinjection of toxic chemicals into the group (PGV claims they're "closed loop" but that is not true), cultural concerns, and the challenges when a lava flow risked igniting 60,000 gallons of pentane stored on-site, which needed help from the governor's emergency order to evacuate the chemicals from the danger zone.

If geothermal can be done in a closed-loop fashion, and further from residents, that would alleviate some concerns, but would make it even more expensive and it is likely that solar with energy storage can meet energy needs more safely and at least four times cheaper.

The objective of this working group seems to be to explore how to weaken regulations to smooth the path for this industry. No legislative environmental committee should be party to working to weaken or "streamline" regulations that are often inadequate to begin with, as evidenced by the poor operating track record of PGV.

Please vote 'no' on these resolutions.

HOUSE COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION

MARCH 18, 2025

HCR 58/HR 54, REQUESTING THE HAWAI'I STATE ENERGY OFFICE TO CONVENE A GEOTHERMAL ENERGY WORKING GROUP TO EVALUATE THE REGULATORY AND POLICY LANDSCAPE SURROUNDING GEOTHERMAL ENERGY IN HAWAI'I

POSITION: SUPPORT

Coalition Earth **supports** HCR 58/HR 54, which requests the Hawai'i State Energy Office to convene a geothermal energy working group to evaluate the regulation and policy landscape surrounding geothermal energy in Hawai'i.

According to a report produced by the Hawai'i Climate Change Mitigation and Adaptation Commission, global sea levels could rise more than three feet by 2100, with more recent projections showing this occurring as early as 2060. In turn, over the next 30 to 70 years, approximately 6,500 structures and 19,800 people statewide will be exposed to chronic flooding. Additionally, an estimated $19 billion in economic loss would result from chronic flooding of land and structures located in exposure areas. Finally, approximately 38 miles of coastal roads and 550 cultural sites would be chronically flooded, on top of the 13 miles of beaches that have already been lost on Kaua'i, O'ahu, and Maui to erosion fronting shoreline armoring.

As we work to reduce carbon emissions and stave off the worst consequences of climate change, we must begin preparing for the adverse impact of sea level rise on our shores. We are now quantifying the speed at which we must act. We cannot continue to develop the 25,800-acre statewide sea level rise exposure area–one-third of which is designated for urban use–without risking massive structural damage and, potentially, great loss of life.

Just two years ago, we witnessed the impact of the climate emergency on our shores. On August 8, 2023, wildfires swept across Maui and killed at least 100 people, making it one of the nation's deadliest natural disasters. The spread of the fires has been attributed to climate change conditions, such as unusually dry landscapes and the confluence of a strong high-pressure system

to the north and Hurricane Dora to the south. The wildfires destroyed over 2,200 structures, including numerous residential buildings, historic landmarks, and school facilities. In September 2023, a report from the United States Department of Commerce estimated the total economic damage of the wildfires to be roughly $5.5 billion. Investing in renewable energy generation could not be more urgent, given the growing threat of climate catastrophes to our island home.

Therefore, **our state should take steps to hasten our transition to a clean energy economy and continue our fight against climate change, including by investing in the potential of geothermal resources, a nearly unlimited source of renewable energy.** The Earth's inner core is as hot as the surface of the sun. As that heat radiates, it heats the rocks and water just beneath the Earth's surface and the steam that process generates can be used to generate heat and electricity. Harnessing geothermal energy can be accomplished at any time, since geothermal resources are reliably available 24 hours a day, 365 days a year.

The United States leads the world in geothermal electricity capacity and generation. Yet, the U.S. has tapped less than 0.6 percent of its available geothermal electricity resources. The National Renewable Energy Laboratory estimates that there is enough geothermal potential under our nation's grounds to constantly produce 4,248,879 megawatts of energy. Notably, geothermal energy presents an opening for an almost seamless transition of investment, technology, and personnel away from fossil fuels. While the needed capital investment for geothermal ranges from $3,000 to $6,000 per kilowatt–as compared to solar and terrestrial wind, which run just $1,700 to $2,100 per kilowatt–this cost is declining as investments in new technology are being made. In terms of both economic and clean energy generation, we cannot afford to miss out on these opportunities.

Our state needs to establish a framework for expanding geothermal exploration and the development of utility-scale geothermal initiatives, goals that can be further accelerated through partnerships with research institutions like the University of Hawai'i's Groundwater and Geothermal Resources Center. Doing so would stimulate further possibilities for aligning public funding and private sector investment for geothermal power generation. Geothermal energy was also identified as both a near-term and mid-term decarbonization pathway in the Hawai'i State Energy Office's *Hawai'i Pathways to Decarbonization Report*, released in 2024.

We must avoid environmental risks when exploring geothermal energy. Relatedly, we should not engage in any geothermal expansion on Hawaiian homelands without beneficiary support. Yet, we would be remiss not to investigate the significant geothermal potential that resides, quite literally, within our island home. As the World Resources Institute has stated, "Next-generation geothermal as a promising path to a zero-carbon power grid. It's a clean, cost-effective way to fill supply gaps when solar and wind aren't available." In that way, geothermal has the capacity to play a major role in strengthening energy resilience for our state.

Coalition Earth is a nongovernmental organization that works to preserve the well-being of people and our planet. We champion policies that advance climate resilience, clean energy, public health, and economic fairness for working families. ***Contact us at info@coalitionearth.org.***

P.O. Box 37158, Honolulu, Hawai`i 96837-0158
Phone: 927-0709 henry.lifeoftheland@gmail.com

COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION
Rep. Nicole E. Lowen, Chair
Rep. Amy A. Perruso, Vice Chair

DATE: Tuesday, March 18, 2025
TIME: 10:45 AM
Conference Room 325

RE: HCR 58 Geothermal Support

Aloha Chair Lowen, Vice Chair Perruso, and Members of the Committee

Life of the Land is Hawai`i's own energy, environmental and community action group advocating for the people and `aina for 55 years. Our mission is to preserve and protect the life of the land through sound energy and land use policies and to promote open government through research, education, advocacy and, when necessary, litigation.

The resolution states, "a coordinated, transparent, and community inclusive process is essential."

The Resolution needs to state that the public can attend (sit in) Working Group meetings.

The amount of commercial scale electricity storage on Oahu is 1530 megawatt-hours (MWh). This consists of three tranches: 532 MWh tied to solar projects, 565 MWh of stand-alone storage, and 453 MWh of storage under development.

If all Oahu generators went offline in one instant, the existing and under development commercial-scale storage could release 382 MW of electricity for four hours. This is less than half of the minimum demand for O`ahu ratepayers. After four hours there would be a grid-wide blackout.

Life of the Land does not have a Ouija board, tarot cards, a crystal ball, nor a magic potion.

We don't know what resources will prove to be part of the portfolio needed to get to net negative greenhouse gas (GHG) emissions for electricity, ground transportation, and aviation.

Life of the Land supports additional energy storage facilities and geothermal and biofuels research and pilot projects that are respectful of community values and the environment. We are aware of geothermal and biofuel pitfalls and have opposed bad geothermal and biofuel commercial-scale projects.

Proposed solutions must be evaluated by considering numerous criteria: will electric bills increase or decrease, and by how much, how will it impact the grid, will it play well with other renewable resources, how will it impact reliability and resilience, is it community friendly, what are the cummulative impacts, and what is a worse case scenario involving extreme weather events including wildfires?

Life of the Land asserts that people and communities must be at the table where decisions are made about where and if renewable infrastructure is being considered. It's not just a box you check off. The process is important. There must be open and transparent discussions that encourage diversity, equity, and inclusion of all people including those of different economic strata. Communities consent is of paramount importance. Communties have a right to say no.

There are alternatives. All have proponents and opponents. The alternatives are chemical storage, pumped storage hydro, fossil fuels, biofuels, biomass, nuclear, and geothermal.

A reasonable solution is based on technology, finance, community, and impacts. It is not when one person says, I know this answer, trust me, I have no data or analysis to back up my position, but I am right.

The solution for Hawai`i will not be the solution for continents.

Hawai`i is different. Continental transmission and distribution electric grids are fundamentally different in multiple ways from isolated island transmission and distribution grids. New York City`s electric grid is part of a supergrid that provides electricity for 240,000,000 people.

Hawai`i is different. Aviation GHG emissions overwhelm other GHG emissions for distant islands with international airports. This is fundamentally different from continents. Depending on what one includes, avaiation GHG emissions are 25-60% of all emissions for Hawaii and 2-4% for the world.

Local solutions are needed that meet the needs of local residents.

Mahalo
Henry Curtis
Executive Director

Environmental Caucus of The Democratic Party of Hawai‘i

March 17, 2025

Testimony in Opposition to HR54/HCR58 Relating to Geothermal Energy Working Group

Submitted to: Chair Nicole E. Lowen, Vice Chair Amy A. Perruso, and Members of the Committee on Energy & Environmental Protection

Date: Tuesday, March 18, 2025 **Time:** 10:45 a.m.

Place: Conference Room 325 and via videoconference

Aloha Chair Lowen, Vice Chair Perruso, and Members of the Committee,

As Co-chairs of the Environmental Caucus of the Democratic Party of Hawaii, we respectfully submit this testimony in opposition to HR54/HCR58, which requests the Hawaii State Energy Office to convene a geothermal energy working group to evaluate the regulatory and policy landscape surrounding geothermal energy in Hawaii.

While we recognize the importance of exploring renewable energy sources to achieve Hawaii's clean energy goals, we have significant concerns about the implications of this measure:

1. **Environmental and Cultural Sensitivities**: Geothermal energy development has historically raised concerns about its impact on Hawaii's unique ecosystems and culturally significant sites. Convening a working group without clear guidelines on addressing these sensitivities risks further marginalizing Native Hawaiian voices and environmental advocates.
2. **Redundancy with Existing Efforts**: Hawaii already has frameworks and initiatives in place to evaluate renewable energy options. Establishing a separate working group for geothermal energy may duplicate efforts and divert resources from more pressing renewable energy priorities.
3. **Lack of Comprehensive Stakeholder Representation**: The measure does not specify how the working group will ensure balanced representation of all stakeholders, including Native Hawaiian communities, environmental organizations, and local residents who may be directly affected by geothermal projects.

We urge the Committee to reconsider the approach outlined in HR54/HCR58. Instead, we recommend leveraging existing renewable energy initiatives and ensuring that any evaluation of geothermal energy is conducted with robust community engagement and a commitment to protecting Hawaii's cultural and environmental heritage.

Thank you for the opportunity to provide testimony.

Mahalo nui loa,
Melodie Aduja and Alan Burdick
Co-chairs, Environmental Caucus of the Democratic Party of Hawaii

HR-54
Submitted on: 3/16/2025 3:19:44 PM
Testimony for EEP on 3/18/2025 10:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Douglas Perrine	Individual	Support	Written Testimony Only

Comments:

Geothermal energy is Hawaii's best option for a firm, zero-emissions, renewable source of electric power. It is urgent that Hawaii attract geothermal investment, and steer clear of nuclear energy, which would be ruinous economically and an extreme environmental hazard. I support HR54, but it could be improved by appropriating funds to pay staff for the working group.

March 16, 2025

SUPPORT FOR HR54 and HCR 58

Dear Chair Lowen, Vice-Chair Perruso, and members of the Committee,

My name is Noel Morin. I support HR54 and HCR58, which are *REQUESTING THE HAWAII STATE ENERGY OFFICE TO CONVENE A GEOTHERMAL ENERGY WORKING GROUP TO EVALUATE THE REGULATORY AND POLICY LANDSCAPE SURROUNDING GEOTHERMAL ENERGY IN HAWAII.*

Geothermal energy production has been around for over a hundred years. The Philippines, New Zealand, Indonesia, and Japan have significant geothermal energy deployments in the Pacific region. They offer Hawaii lessons that can speed up our progress in this energy space.

Geothermal energy is increasingly important in the energy transition across the nation because of technological advances in drilling and heat and electricity generation. It can play a critical role in accelerating our transition to a clean energy future and even establishing related industries dependent on access to low-cost, abundant, clean energy. For this to occur sustainably, it is essential that we establish a robust **strategy** and **roadmap** that addresses cultural, social, economic, and environmental considerations to guide the discovery and development efforts.

This resolution calls for a working group to facilitate essential tasks that can contribute to the strategy and roadmap.

I highly recommend that the working group include a Community-Based Organization that will ensure that cultural and social considerations are incorporated into the plan.

Please support HR54 and HCR58.

Thank you for the opportunity to testify.

Sincerely,
Noel Morin
Climate, Sustainability, and Resilience Advocate
Hilo, Hawaii

HR-54
Submitted on: 3/17/2025 7:24:10 AM
Testimony for EEP on 3/18/2025 10:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Helen Cox	Individual	Support	Written Testimony Only

Comments:

Chair and Committee Members,

I am writing to support HR54/HCR58 to create a geothermal working group. As Hawaii moves towards renewable energy, it is imperative that we explore this source of energy and its feasibility for Hawaii. Mahalo for taking my testimony.

Helen Cox

Kalaheo, Kauai

HR-54
Submitted on: 3/17/2025 8:06:37 AM
Testimony for EEP on 3/18/2025 10:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Alice Kim	Individual	Support	Written Testimony Only

Comments:

The State of Hawaii should encourage geothermal development by simplifying and streamlining permitting, supporting geothermal research, and promoting efficiency in geothermal regulations. Geothermal energy will help Hawaii reach its 100% renewable source mandate by 2045. Please invest in Hawaii's geothermal development.

HR-54
Submitted on: 3/17/2025 9:14:31 AM
Testimony for EEP on 3/18/2025 10:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Ronald "Ron" Reilly	Individual	Support	Written Testimony Only

Comments:

Strong Support for HR54 and HCR58

Chair Lowen, Vice Chair Perruso, and Members of the Committee On Energy & Environmental Protection,

The development of geothermal beyond the active rift zone in Puna seems to be a key to meeting Hawaii's clean energy goals. Responsible geothermal can provide stable baseline power 24/7 at competitive pricing, without the variability of wind and solar.

New advanced geothermal drilling technology offers the possibility that geothermal can provide reliable clean power not just on Hawaii Island but on all the Hawaiian Islands.

I urge your support for HR54 and HCR58

Thank you, Ron Reilly, Volcano Village

HR-54
Submitted on: 3/16/2025 7:13:11 AM
Testimony for EEP on 3/18/2025 10:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Keoni Shizuma	Individual	Oppose	Written Testimony Only

Comments:

Aloha Committee members of the House Committee on Energy & Environmental Protection,

I am testifying in opposition to this resolution.

I understand the need to find an environmentally friendly alternative to energy production, but I do not think geothermal energy is our answer. Unlike wind, solar, or wave energy generation, geothermal requires permanent damage and desecration to the environment.

In Hawaiian culture, the surface of the ground is sometimes seen as a body form of our goddess Papahānaumoku. To drill into the ground would be to desecrate parts of her, while if wind, solar, or even wave energy generation was pursued, all the structures would be temporary and merely sit on the surface (or in the ocean).

Out of respect for Hawaiian culture, values, and beliefs, Hawaii should not pursue geothermal energy generation. We live in the perfect environment for innovations in renewable energy technology. Let Hawaii become a leader in new techniques and technologies in this field, push forth the field at the University of Hawaii, and learn from international leaders of energy technology.

As the Committee on Energy & Environmental Protection, being the leader in innovative green energy creation would both protect our environment and generate energy. With nearly-perfect weather year-round, we have the opportunity to develop new technologies that the world can use.

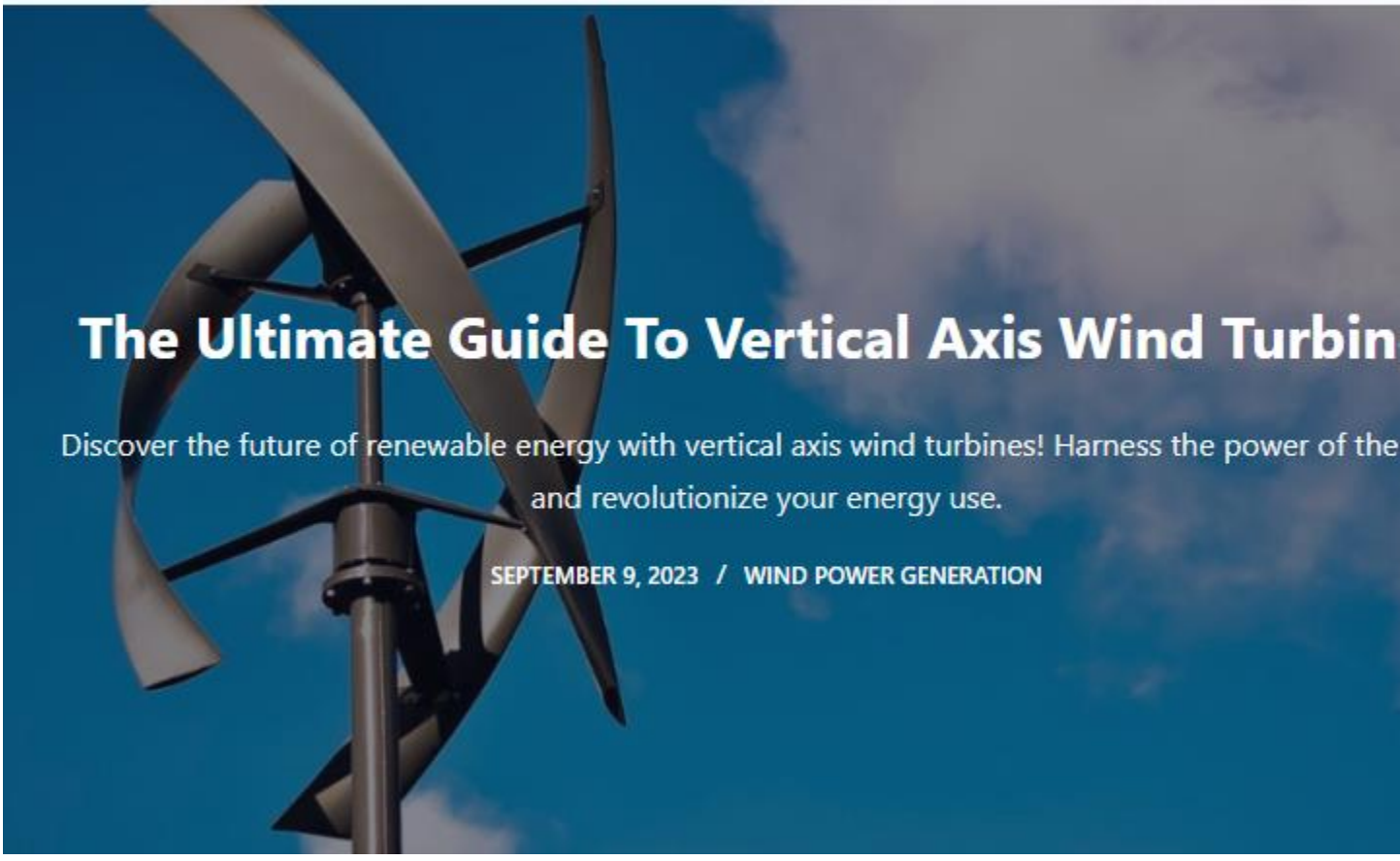
Innovations in wind technology in Denmark, where smaller scale wind turbines designed for communities and/or personal use can help to decentralize our energy grids, helping communities to become more sustainable and resilient to natural disasters. Exploring the use of these technologies would also diminish the need for high-voltage powerlines to carry centrally created electricity across long-distances, which creates a risk for wildfires, as we all know now. Decentralized energy solutions would also lessen the need to bury thousands of miles of existing powerlines into the ground to prevent fire disasters from occurring in high-wind scenarios.

Another benefit to decentralized solutions like smaller-scale wind turbine systems, is that the community in which the systems are installed are the ones who both benefit from the technologies, as well as burden any negative environmental or community impacts as well. If a

geothermal energy production system was to be created, the community where it is built would be the only ones to have the burden of the negative environmental and community impacts, while other communities would benefit from the energy production. Thus, decentralized solutions are more fair for the communities where the renewable energy systems are created.

When the City and County of Honolulu decided to build the rail system, it was already an older technology, and when it is finally finished, it'll be outdated and inefficient compared to similar technologies at the time. Let's not do the same with renewable energy. Let's not invest in old centralized technologies like geothermal and large windmills. Let's look to future innovations that allow for decentralization, that are culturally sensitive, more efficient, less disruptive, and easily accepted by the people it may affect.

Attached are some examples of smaller scale wind energy technologies that should be explored here in Hawaii, ahead of geothermal, as well as a link to learn more about it: [Youtube link]



Mahalo for your consideration,
Keoni Shizuma

HR-54
Submitted on: 3/16/2025 3:18:17 PM
Testimony for EEP on 3/18/2025 10:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Terri R Markovich	Individual	Oppose	Written Testimony Only

Comments:

Honorable Rep. Nicole Lowen,

I am writing in opposition to this study and believe we need to learn from the problems that Puna Geothermal is facing before we invest any more. Geothermal is promising, especially with new technology, but we must consider placing geothermal far enough away from populations, and consider the newest technologies, expense and new rgulations needed for safe operation.

Mahalo for this consideration,

Terri Markovich-Honokaa,Hawaii

HR-54
Submitted on: 3/17/2025 2:03:26 PM
Testimony for EEP on 3/18/2025 10:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Janice Palma-Glennie	Individual	Oppose	Written Testimony Only

Comments:

Aloha,

if you've been in hawai`i long enough, you know that far too many residents, for good reasons, oppose the investigation or futher use of geothernal as an alternative energy source for our state. Though people like to tout New Zealand's experience as an example of how it could be in hawai`i, it seems clear that our sitautions are far different while obtaining and using the fuel poses far more risks to destruction, not protection, of our native environment and communities.

mahalo for voting "NO" on HCR58

LATE *Testimony submitted late may not be considered by the Committee for decision making purposes.

HR-54
Submitted on: 3/17/2025 2:47:53 PM
Testimony for EEP on 3/18/2025 10:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Caroline Azelski	Individual	Support	Written Testimony Only

Comments:

Support. Thank you.

LATE *Testimony submitted late may not be considered by the Committee for decision making purposes.

HR-54
Submitted on: 3/17/2025 5:58:44 PM
Testimony for EEP on 3/18/2025 10:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Melissa Barker	Individual	Support	Written Testimony Only

Comments:

I am writing to respecfully ask that you support HR54 which requests the State energy office to convene a geothermal working group.

Thank you for your attention and consideration.

Melissa Barker

Kapaa, HI