



**UNIVERSITY OF HAWAII SYSTEM**

**‘ŌNAEHANA KULANUI O HAWAII**

Legislative Testimony

Hō'ike Mana'o I Mua O Ka 'Aha'ōlelo

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Testimony Presented to the  
Senate Committee on Energy, Economic Development, and Tourism  
Senate Committee on Public Safety and Intergovernmental and Military Affairs  
Senate Committee on Higher Education  
Wednesday, February 15, 2023 at 3:01 p.m.  
by  
Vassilis L. Syrmos  
Vice President for Research and Innovation  
University of Hawai'i System

**SB 458 – RELATING TO GEOTHERMAL ROYALTIES**

Chairs DeCoite, Wakai and Kim, Vice Chairs Wakai, Elefante and Kidani, and Members of the Committees:

The University of Hawai'i (UH) is in support of SB 458, which seeks to further the discovery and development of geothermal resources by establishing the University of Hawai'i Geothermal Exploration Special Fund for the Hawai'i Groundwater and Geothermal Resources Center (HGGRC).

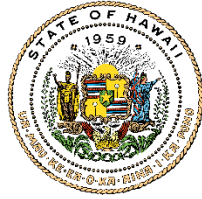
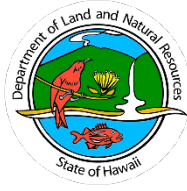
The HGGRC, based in UH Mānoa's heralded School of Ocean and Earth Science and Technology, has the knowledge and expertise in geothermal exploration to help the state secure another clean energy source in its drive to achieve a more sustainable future.

At the same time, UH recognizes and understands the concerns raised by the Department of Land and Natural Resources about this measure.

Thank you for the opportunity to testify.

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

SYLVIA LUKE  
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAI'I  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
KA 'OIHANA KUMUWAIWAI 'ĀINA

P.O. BOX 621  
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DAWN N.S. CHANG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
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FIRST DEPUTY

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AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
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CONSERVATION AND COASTAL LANDS  
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ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

Testimony of  
DAWN N. S. CHANG  
Chairperson

Before the Senate Committees on  
ENERGY, ECONOMIC DEVELOPMENT, AND TOURISM  
and  
PUBLIC SAFETY AND INTERGOVERNMENTAL AND MILITARY AFFAIRS  
and  
HIGHER EDUCATION

Wednesday, February 15, 2023  
3:01 PM  
State Capitol, Conference Room 225

In consideration of  
SENATE BILL 458  
RELATING TO GEOTHERMAL ROYALTIES

Senate Bill 458 proposes to: (1) cap the amount of royalties from geothermal resources that are to be paid to the State and to the county in which the geothermal resources are located; (2) deposit royalties into the University Innovation and Commercialization Initiative Special Fund, to be expended by the Hawai'i Groundwater and Geothermal Resources Center, to further the discovery and development of geothermal resources; and (3) require entities that received geothermal royalties to submit an annual report to the Legislature. **The Department of Land and Natural Resources (Department) appreciates the intent of this measure to allow for further discovery and development of geothermal resources but respectfully opposes this measure as written because of the reduction in percentage and cap on the amount of royalties the Department is currently receiving.**

The Department, pursuant to Hawai'i Revised Statutes, Chapter 182, has a statutory obligation to regulate the use of minerals, including geothermal resources, as it is held in public trust. As such, the Department bears all costs for processing, negotiating and managing geothermal leases, and regulating well drilling operations for exploration and development of the resource. In exchange, the Department receives 50% of the geothermal royalties while the remaining proceeds are allocated as follows: 30% to the County of Hawai'i, and 20% to the Office of Hawaiian Affairs (OHA) which represents its pro rata share of ceded land revenues. Cumulative Geothermal Mineral Resources Program expenditures

(excluding lease and lease management costs) since the program was reestablished in Fiscal Year 2008 is roughly equal to the Department's 50% share of the royalties in the same period.

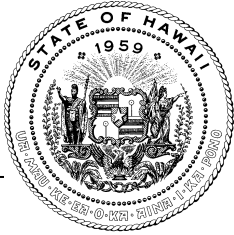
The Department recognizes that geothermal development is a component of Hawai'i's Clean Energy Goals. However, the Department opposes the diversion of funds away from programs that are mandated to regulate the protection of this public trust resource. The Department also opposes the provision that caps the amount of royalties the State can receive. As geothermal development expands, additional resources will be necessary to address future regulatory, leasing and other necessary duties to continue the protection of the resource, environment, and public health and safety. The geothermal royalties received by the Department are deposited into its Special Land and Development Fund (SLDF)<sup>1</sup> that funds the Geothermal Mineral Resources Program. The SLDF also funds the entire annual operating budget for the Department's Land Division, the Office of Conservation and Coastal Lands, the Dam Safety Program and other critical programs that play important roles in protecting Hawai'i's natural and cultural resources. Such departmental programs address critical issues such as climate change, watershed protection, invasive species, water resources, coastal erosion and protection of the State's historic and cultural sites. Any reduction in the revenues generated from geothermal royalties will reduce the Department's ability to effectively administer many of these programs.

Lastly, enhancing revenue generation to become more self-sufficient and not rely as much on general funds is a departmental goal. This measure is counter-productive and will curtail the Department's ability to achieve this goal.

Mahalo for the opportunity to testify on this measure.

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<sup>1</sup> The primary source of revenue for the SLDF are lease rents collected by the Department's Land Division from its 1,000 or so leases and 300 or so permits, including the geothermal mining lease.



# HAWAII STATE ENERGY OFFICE STATE OF HAWAII

JOSH GREEN, M.D.  
GOVERNOR

MARK B. GLICK  
CHIEF ENERGY OFFICER

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Testimony of  
**MARK B. GLICK, Chief Energy Officer**

before the  
**SENATE COMMITTEES ON  
ENERGY, ECONOMIC DEVELOPMENT, AND TOURISM;  
PUBLIC SAFETY AND INTERGOVERNMENTAL AND MILITARY AFFAIRS;  
AND  
HIGHER EDUCATION**

Wednesday, February 15, 2023  
3:01 PM  
State Capitol, Conference Room 225 & Videoconference

Providing **COMMENTS** on  
**SB 458**

## **RELATING TO GEOTHERMAL ROYALTIES.**

Chairs DeCoite, Wakai, and Kim; Vice Chairs Wakai, Elefante, and Kidani, and Members of the Committees, the Hawai'i State Energy Office (HSEO) offers comments on SB 458 and defers to DLNR on the impacts of this measure on its regulatory oversight capabilities.

Royalties from geothermal development play an important role in the appropriate development, management and regulatory oversight of Hawai'i's geothermal resources. HSEO supports funding for geothermal exploration by the Hawai'i Groundwater and Geothermal Resources Center (HGGRC) provided such funds are not diverted from the Department of Land and Natural Resources' (DLNR) programs needed for regulatory oversight to develop and manage geothermal and other essential forms of Hawai'i's diversified renewable energy portfolio under the Land Division, Office of Conservation and Coastal Lands, Dam Safety Program, and Mineral Resources Program. HSEO supports efforts by HGGRC and other entities to seek federal and other funding for geothermal research and to engage with affected communities on the results of such

research and support associated geothermal development that is widely recognized to be in the public interest.

Thank you for the opportunity to testify.



## SB458

### RELATING TO GEOTHERMAL ROYALTIES

Senate Committee on Energy, Economic Development, and Tourism  
Senate Committee on Public Safety and Intergovernmental and Military Affairs  
Senate Committee on Higher Education

February 15, 2023

3:01 PM

Room 225

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The Administration of the Office of Hawaiian Affairs (OHA) will recommend to the Board of Trustees the position of **COMMENT** on SB458, which would establish the University Innovation and Commercialization Initiative Special Fund for geothermal royalties. **OHA takes this opportunity to respectfully remind the Legislature that Native Hawaiians maintain significant socio-political-economic-environmental interests related to tūtū Pele and her connection to the geothermal systems of the Hawaiian Islands; interests that do not appear to be represented by this measure.**

As the principal public agency in the State responsible for the betterment of conditions of Native Hawaiians,<sup>1</sup> OHA wishes to emphasize that Native Hawaiian land claims, which include claims to the natural and cultural resources therein, are still outstanding and have yet to be resolved.<sup>2</sup> The Legislature, in recognizing the historical special political relationship between the Native Hawaiian people and the United States, as well as understanding the historical injustices that have and continue to create systems of inequity and disparities faced by Native Hawaiians, enshrined, within the Constitution<sup>3</sup> and statutes of the State, a series of legal frameworks and instruments to identify the State's trust obligations to the Native Hawaiian people.<sup>4</sup> These trust obligations extend to compensatory mechanisms for Native Hawaiians, which include legal mandates to a share of the income and proceeds from the public land trust<sup>5</sup> and proceeds from natural resources, minerals and income derived from whatever other sources for Native Hawaiians.<sup>6</sup>

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<sup>1</sup> Haw. Rev. Stat. §10.

<sup>2</sup> "Whereas, the indigenous Hawaiian people never directly relinquished their claims to their inherent sovereignty as a people or over their national lands to the United States, either through their monarchy or through a plebiscite or referendum[.]" Pub. Law 103-150 (1993).

<sup>3</sup> Haw. Stat. Con. Article XII (1978).

<sup>4</sup> Haw. Rev. Stat. §10H.

<sup>5</sup> Pub. L. 86-3, 73 Stat. 4; Hawai'i Admissions Act of 1959; Haw. Stat. Con. Article XII, Sec. 4-6 (1978).

<sup>6</sup> Haw. Stat. Con. Article XII, Sec. 6 (1978).



## SB458

### RELATING TO GEOTHERMAL ROYALTIES

Senate Committee on Energy, Economic Development, and Tourism  
Senate Committee on Public Safety and Intergovernmental and Military Affairs  
Senate Committee on Higher Education

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The majority of Native Hawaiian families, in Hawai‘i, are unable to make ends meet,<sup>7</sup> with 63% of Native Hawaiians reporting that they are finding it difficult to get by.<sup>8</sup> Native Hawaiians have the lowest household income.<sup>9</sup> Native Hawaiians have the highest poverty rates for individuals and families.<sup>10</sup> Native Hawaiians make less money,<sup>11</sup> with lower average earnings for both men and women.<sup>12</sup> Native Hawaiians have the highest rate of using public assistance and homeless services.<sup>13</sup> Native Hawaiians are overrepresented among the homeless in Hawai‘i.<sup>14</sup> OHA is deeply concerned with Native Hawaiians being driven out of Hawai‘i by economic instability stemming from socio-political-economic upheaval, which has largely disconnected Native Hawaiians from their ‘āina for more than a century. Today, more Native Hawaiians live outside of the Hawaiian Islands, far beyond the boundaries of their own homeland.<sup>15</sup>

**OHA asks the Legislature to take into consideration that this measure would better serve the rights and interests of the Native Hawaiian people by dedicating a fair portion of the proceeds and income from the exploitation of geothermal resources to the Native Hawaiian people.** Accordingly, the calculation of this fair portion should be representative of the comparative percentage of the Native Hawaiian population to the total resident population (approximately 38%);<sup>16</sup> the Native Hawaiian population should be calculated in its totality, as

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<sup>7</sup> Aloha United Way / United for ALICE, *ALICE in Hawai‘i: 2022 Facts and Figures*, Nov. 2022, p.6.

<sup>8</sup> *Id.* at 9.

<sup>9</sup> Dept. of Business, Economic Development and Tourism, *Demographic, Social, Economic, and Housing Characteristics for Selected Race Groups in Hawaii*, Mar. 2018, p.3.

<sup>10</sup> *Id.* at 13.

<sup>11</sup> OHA Report, *Affordable Housing for Hawai‘i and Native Hawaiians: Exploring Ideas and Innovation*, Aug. 2020, p.10.

<sup>12</sup> Dept. of Native Hawaiian Health, John A. Burns School of Medicine, *Assessment and Priorities for the Health and Well-Being in Native Hawaiians and Pacific Islanders*, 2020, p.12.

<sup>13</sup> *Id.*

<sup>14</sup> Partners In Care, *2022 Point In Time Count*, p.7.

<sup>15</sup> “Estimates from the American Community Survey showed that in 2011, there were about 296,400 Native Hawaiians in Hawai‘i and about 221,600 on the continental U.S. Just a decade later, those numbers flipped. In 2021, there were about 309,800 Native Hawaiians in Hawai‘i and about 370,000 in other states,” Hawaii Public Radio, *More Native Hawaiians Flock to mainland cities and leave Hawai‘i*, Jan. 23, 2023, *citing high costs*, citing the US Census Bureau’s American Community Survey 2021.

<sup>16</sup> There are approximately 309,807 Native Hawaiians living in the State of Hawai‘i. The total estimated Native Hawaiian population is 680,353. The U.S. Census Bureau 2022 Population Estimates of the State of Hawai‘i is 1,440,196. Based on these numbers, the State population would be 1,810,742 if Native Hawaiians lived in their



## **SB458**

### **RELATING TO GEOTHERMAL ROYALTIES**

Senate Committee on Energy, Economic Development, and Tourism  
Senate Committee on Public Safety and Intergovernmental and Military Affairs  
Senate Committee on Higher Education

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the “only indigenous, aboriginal, maoli people of Hawai‘i, who should not be counted out for being driven out of these Islands.”<sup>17</sup> Finally, the respective percentages of the income and proceeds from geothermal resource exploitation from public lands should be managed and administered by OHA in accordance with the State Constitution.<sup>18</sup>

OHA appreciates this opportunity to offer comments on SB458 with the hope that the State will continue to uphold its trust obligations to the Native Hawaiian people, who, due to the ongoing impacts of historical justice, continue to face inequities and disparities at a disproportionately higher rate than all others in the State of Hawai‘i. Mahalo nui loa.

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own homeland. Accordingly, the Native Hawaiian population percentage would be approximately 38%.

<sup>17</sup> Haw. Rev. Stat. §10H-1.

<sup>18</sup> Haw. Stat. Con. Art. Sec. 4-6 (1978).



**SB-458**

Submitted on: 2/14/2023 8:04:12 AM

Testimony for EET on 2/15/2023 3:01:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Testify</b>
Douglass S. Adams	Testifying for Research and Development, County of Hawaii	Comments	Written Testimony Only

Comments:

Chairs DeCoite, Wakai, and Kim, Vice Chairs Elefante and Kidani, and Members of the Committees on Energy, Economic Development, and Tourism, Public Safety and Intergovernmental and Military Affairs, and Higher Education:

Thank you for the opportunity to testify on SB 458, which caps the amount of royalties from geothermal resources that are to be paid to the State and to the county in which the geothermal resources are located, while providing for the deposit of royalties into the University Innovation and Commercialization Initiative Special Fund, to be expended by the Hawaii Groundwater and Geothermal Resources Center, to further the discovery and development of geothermal resources.

The County of Hawaii fully acknowledges the need for discovery and development of geothermal resources throughout the state, particularly on Hawaii Island, and strongly supports the concept of employing royalties that the state receives as a component of funding this scientific exploration. The County also notes that funding distributed to the County from royalties received by the state pursuant to Section 182-7, Hawaii Revised Statutes, continues to be of great assistance in providing for Community Benefits. Consequently, the County encourages the Committees to modify SB 458 to the extent that funding provided to a "county in which mining operations covered under a state geothermal resource mining lease are situated" is not negatively impacted by this bill.

We encourage the Committees to move SB 458, with the abovementioned modifications, forward with a positive recommendation for passage by the Senate.

very respectfully,

Douglass S Adams

Director, Dept of Research & Development

County of Hawaii



Written Statement of  
**David H. Molinaro**  
HCATT Manager  
Hawaii Center for Advanced Transportation Technologies  
before the  
**Senate Committee on Energy, Economic Development and Tourism**  
**Senate Committee on Public Safety and Intergovernmental and Military Affairs**  
and the  
**Senate Committee on Higher Education**  
Wednesday, February 15, 2023  
3:01pm  
State Capitol, Conference Room 225  
In consideration of  
  
**SB 458**  
**RELATING TO GEOTHERMAL ROYALTIES**

Chairs DeCoite, Wakai, Kim; Vice Chairs Wakai, Elefante, Kidani, and Members of the  
Committee.

The Hawaii Center for Advanced Transportation Technologies (HCATT) **supports** SB458 to fund the innovation and development of geothermal technologies by the University of Hawaii Groundwater and Geothermal Resources Center (HGGRC) through the distribution of royalties from geothermal resources. Geothermal energy is a principal renewable energy resource for the expansion of utility scale renewable energy and the production of hydrogen, which will help Hawaii fulfill its commitment to significantly reduce carbon emissions.

The use of geothermal energy further provisions Hawaii Revised Statute §196-10, Hawaii renewable hydrogen program legislative guidance to design, implement, and administer hydrogen projects, including infrastructure for the production, storage and refueling of hydrogen vehicles and in adopting hydrogen technologies in support of Hawaii's 2045 RPS mandate and foster a new renewable energy industry in this State.

HCATT acknowledges the potential impact to the distribution of royalties on to both the Department of Land and Natural Resources and Department of Hawaiian Homelands and encourage the Legislature to consider the testimony of those agencies.

Mahalo for the opportunity to present this testimony.





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[www.sustainableenergyhawaii.org](http://www.sustainableenergyhawaii.org)

COMMITTEE ON ENERGY, ECONOMIC DEVELOPMENT, AND TOURISM  
Senator Lynn DeCoite, Chair  
Senator Glenn Wakai, Vice Chair

COMMITTEE ON PUBLIC SAFETY AND INTERGOVERNMENTAL AND MILITARY AFFAIRS  
Senator Glenn Wakai, Chair  
Senator Brandon J.C. Elefante, Vice Chair

COMMITTEE ON HIGHER EDUCATION  
Senator Donna Mercado Kim, Chair  
Senator Michelle N. Kidani, Vice Chair

**DATE: Tuesday, February 15, 2023**

**TIME: 3:01 PM**

**PLACE: Conference Room 225 & Videoconference**

**SB458 - Relating to Geothermal Royalties**

Aloha Chairs DeCoite, Wakai, Kim and Members of the Committees,

**Sustainable Energy Hawai'i (SEH) supports SB 458.** SEH is a 501(c)3 non-profit dedicated to improving the quality of life for Hawaii Island residents. Our mission is to enable an economic, social, and environmental revival in Hawaii through a just transition to sustainable, locally sourced renewable energy and to that end, the creation of a thriving clean hydrogen economy.

Our support for SB458 stems from our belief that expanded geothermal power generation in the State of Hawai'i is essential to our collective, long-term energy security. We would like to add that stable consistent funding for geothermal research in the millions of dollars should be legislated as 'Essential Hawaii State Energy Policy', reasoned by the following comments.

### **Comments**

#### **Renewable Energy in the Near Term**

Hawaii, via RPS 2045, is pursuing the goal to become the first US state to achieve 100% renewable energy. SEH believes that in this pursuit the State must consider the sustainability, long-term reliability & affordability of the renewable energy systems being built today; solar and wind

systems, both of which are intermittent and require battery storage systems to balance grid load and stability over any given day. The idea that we need renewable firm, dispatchable, baseload power production is well known but has not been made a public policy priority ... yet.

Our options for that type of renewable energy system in Hawaii are realistically limited to hydroelectric and geothermal systems, the latter of which holds enormous potential in our State. The University of Hawaii & its Hawaii Groundwater & Geothermal Resource Center is well positioned to bring us closer to realizing this potential if properly funded.

### **Sustainability of Renewable Power Systems**

[https://vimeo.com/manage/videos/763183483?embedded=true&source=vimeo\\_logo&owner=8689699](https://vimeo.com/manage/videos/763183483?embedded=true&source=vimeo_logo&owner=8689699)

Current trends in the upstream supply chain for intermittents are unreliable:

- All intermittent systems require critical raw materials (CRM) for their manufacture, much of which is mined within the borders of Russia and China.
  - Demand outstrips supply consistently driving prices up year over year.
- These systems have life cycles of between 15 & 25 years resulting in the need for continuous replacement.
- It is reasonable to expect the replacement cost of these systems will far exceed their original price as the entire developed world competes for the limited CRM needed to achieve our needed climate goals. This means the natural resources necessary to economically rely on these systems for more than a single generation is very much in question.

Counting on future technological breakthroughs does not form a credible foundation for present-day public policy. In other words, commercially satisfying the global scale of any future technology cannot be guaranteed by the known availability of the natural resources required supply them. (<https://smi.uq.edu.au/event/session/11743>)

SEH sees these facts alone as justification to modernize Hawaii's long-term energy policies with the intent to incentivize the investment needed to develop robust geothermal power systems; systems with proven multi-generational time spans and whose construction relies primarily on base metals, not CRM.

### **Economic History of Geothermal**

Geothermal power development in Hawaii has historically been faced a gauntlet of socio-economic and regulatory challenges. Huge up-front costs within a small grid-based market and virtually no growth opportunities while needing to navigate a permitting process that pushes investment away from Hawaii.

With the advent of an emerging global hydrogen economy, the ability to produce hydrogen 24-7-365 should demonstrate the economic growth potential needed to attract that investment. What needs to accompany this is a modernized regulatory environment that reflects a fossil fuel free energy paradigm.

Sustainable Energy Hawaii is prepared to offer additional data and policy options in support of future legislation at your convenience.

Mahalo for the opportunity to testify,

A handwritten signature in black ink, appearing to read 'Peter Sternlicht', with a stylized flourish at the end.

Peter Sternlicht  
Member, Board of Directors  
Sustainable Energy Hawaii  
[peter@sustainableenergyhawaii.org](mailto:peter@sustainableenergyhawaii.org)



Email: [communications@ulupono.com](mailto:communications@ulupono.com)

SENATE COMMITTEES ON ENERGY, ECONOMIC DEVELOPMENT, & TOURISM, PUBLIC SAFETY  
& INTERGOVERNMENTAL & MILITARY AFFAIRS, AND HIGHER EDUCATION  
Wednesday, February 15, 2023 — 3:01 p.m.

**Ulupono Initiative supports SB 458, Relating to Geothermal Royalties.**

Dear Chair DeCoite, Chair Wakai, Chair Kim, and Members of the Committees:

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 SB 458**, which caps the amount of royalties from geothermal resources that are to be paid to the State and to the county in which the geothermal resources are located; deposits royalties into the University Innovation and Commercialization Initiative Special Fund, to be expended by the Hawai'i Groundwater and Geothermal Resources Center, to further the discovery and development of geothermal resources; and, requires the entities that received geothermal royalties to submit an annual report to the Legislature.

Hawai'i needs all viable forms of renewable energy to meet the 100% renewable portfolio standard by 2045. Wind and solar alone are not enough. Firm sources, such as geothermal, will also be necessary. Hawai'i also faces many competing demands for available land, and geothermal projects use the least amount of land per megawatt of renewable power produced.

Most residents seem to believe the Big Island is the only place in which geothermal energy can be commercially produced, and yet that assumption has never been thoroughly researched and confirmed. It makes good sense to use a modest amount of geothermal royalties to see if there is an opportunity to expand this firm, low land impact form of renewable energy.

Thank you for the opportunity to testify.

Respectfully,

Micah Munekata  
Director of Government Affairs

*Investing in a Sustainable Hawai'i*

Statement of  
**Stanley Osserman Jr., President,**  
**Tigershark Energy Consulting Hawaii – Hydrogen, LLC.**  
before the  
**Senate Committees on Energy, Economic Development and Tourism, and**  
**Senate Committee on Public Safety and Intergovernmental and Military Affairs, and**  
**Senate Committee on Higher Education**

15<sup>th</sup> day of February 2023  
3:01 pm  
State Capitol, Conference Room #225

In consideration of  
**Bill Number: SB 458**  
**Relating to: Geothermal Royalties**

Chairs: Decoite, Wakai and Mercado-Kim and,

Vice Chairs: Wakai, Elefante and Kidani and members of their Committees

As the former Director of the Hawaii Center for Advanced Transportation Technologies (2013-2019), Under the Hawaii Department of Business, Economic Development and Tourism (DBEDT) and appointed in Hawaii Revised Statute as the Hydrogen Implementation Coordinator for the state, I continue to serve our state by promoting the application of hydrogen technologies to replace fossil fuels and promote a hydrogen economy in our state by doing business as (DBA) Tigershark Energy Consulting Hawaii – Hydrogen, LLC. This testimony is being given, not as a paid consultant or lobbyist, but as a professional that has been promoting hydrogen technology for the betterment of our state and nation. I am not being compensated by any individual, company, organization, or group as I provide this testimony. It is my belief that Geothermal power will be a vital key to Hawaii becoming energy independent and 100% fossil fuel free by 2045.

I stand in Strong Support of SB458 that that addresses the equitable distribution of royalties generated by geothermal power production.

I am a life long resident of Hawaii and also have been deeply involved in Hawaii's transition to clean energy for over a decade. I am concerned that strategic plans to fulfill the Renewable Portfolio Standards (RPS) enacted by the State have not fully considered the

monumental challenge that the RPS presents to our state, nor do many business leaders and policy makers appreciate the beneficial economic impact that becoming “energy independent” offers our state. Consider that, in the view of most people, Solar PV and LI batteries will be the key to reaching the RPS end state. Most also view Puna Geothermal Ventures as Hawaii’s model for geothermal power. The math I’ve done tells me that Solar PV alone will be too expensive at scale and take up too much valuable land that should be used for housing or agriculture. Intermittent power, like Solar PV and Wind is destabilizing for our grids as they are designed. Solar PV is a valuable asset to rural communities and single-family dwellings but cannot replace the power generated by our fossil fuels at scale. Wind power is proving to be popular where land is plentiful, migratory birds are limited, and winds are steady and remain under 40 mph. In Hawaii, large scale wind farms are not compatible with tourism, our native wildlife and local values. However, geothermal power is clean and firm power that suits our current grid structure, but can also support the increased demand we face as we move away from fossil fuels.

The factors laid out above are important to understand as you consider this bill, because the royalties will be substantial, and I haven’t even articulated the transition of ground transportation to electric, and aircraft and cargo shipping to hydrogen based fuels that need to be made in Hawaii and support tourism and the military. Geothermal power will be vital to make Hawaii energy independent and will turbocharge our whole economy, creating careers for future generations and a cleaner environment for all.

My recommendations to improve this bill are as follows:

- 1) I know that there is a reason that much of the language in this bill relates to “mining” and “Mining royalties”, however I question the need for most of section “2” talking about a variety of mined commodities, some of which appear to be rock based rather than metallic ore, and most of which has nothing to do with “Geothermal Royalties”
- 2) The Native Hawaiian communities have, from my observation, been often shortchanged as technology and “progress” march on, particularly considering they have land, but can’t afford to develop it for Hawaiian communities. I therefore find it important that the parts of this bill, not only recognize the exclusivity of royalties for geothermal built on Hawaiian Homes land remain revenues strictly for Hawaiian Homes use, but I further



would like to see that 30+ percent of all Geothermal power project in Hawaii be built on Hawaiian Homes land, and if this is not practicable, that land exchanges, seeding or selling of state land to Hawaiian Homes Lands be transacted such that at least 30% of the royalties paid in support of geothermal power production remains in the complete domain of the Hawaiian community via Hawaiian Homes Lands to provide for Hawaiian benefit into perpetuity. This just seems like the fair thing to do as we go forward towards a sustainable community.

Mahalo for the opportunity to testify on this important proposed legislative matter.

Stanley J. Osserman Jr., President

Tigershark Energy Consulting Hawaii – Hydrogen, LLC.

**SB-458**

Submitted on: 2/12/2023 10:46:05 PM

Testimony for EET on 2/15/2023 3:01:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Testify</b>
Alice Kim	Individual	Support	Written Testimony Only

Comments:

The State of Hawaii should encourage further discovery and development of geothermal resources. As Hawaii is the only U.S. state without an official geological survey, the University of Hawaii (UH) contributed a bulk of what we know about Hawai'i's geology. Since producing Hawai'i's first geothermal well (HGP-A) in the 1970s, UH has led Hawaii's geothermal research. From the 1980s to now, UH contributed to two statewide geothermal resource assessments.

As a UH research unit, the Hawaii Groundwater and Geothermal Resources Center (HGGRC) conducted research that suggests that all of the major Hawaiian islands may hold geothermal resources. However, much of these resources remain unexplored, and HGGRC needs more funding to reveal more information about them.

HGGRC is well equipped for geothermal exploration in terms of its expertise, land access for research, and physical assets. Through HGGRC, the state's foremost experts in earth sciences are researching Hawaii's geothermal resources. HGGRC obtained land access for research from dozens of landowners across the state. For research equipment, HGGRC has access to \$1 million worth of geophysical equipment and a \$3 million drill rig.

Beyond expanding the knowledge of Hawaii's geothermal resources, HGGRC has also provided students and new professionals hands-on, collaborative research experiences and educational opportunities. Collectively, their backgrounds include not only earth sciences but also environmental engineering, information technology, library science, historical research, and community outreach. Over the years, HGGRC sponsored employment of dozens of employees, and HGGRC scientists provided academic advising for undergraduate capstone projects, master's theses, and PhD dissertations.

The state should further tap geothermal--a firm, renewable energy source, should support geothermal research, and should develop researchers. Further development of geothermal will enable the state to transition off of fossil fuels and achieve its 100% renewable policy objective by 2045. Please invest in not only the further development of Hawaii's geothermal resources but also knowledge of Hawaii's geology and highly skilled, educated professionals for Hawaii's future economy. Please invest in HGGRC.