

DAVID Y. IGE  
GOVERNOR OF HAWAII



**STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES**

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

**Testimony of  
SUZANNE D. CASE  
Chairperson**

**Before the House Committee on  
ENERGY & ENVIRONMENTAL PROTECTION**

**Tuesday, March 15, 2022  
9:00 AM**

**State Capitol Conference Room 325 & Videoconference**

**In consideration of  
SENATE BILL 3229, SENATE DRAFT 2  
RELATING TO GEOTHERMAL ROYALTIES**

Senate Bill 3229, Senate Draft 2 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) Establish the University of Hawaii Geothermal Exploration Special Fund for the Hawaii Groundwater and Geothermal Resources Center to further the discovery and development of geothermal resources; and (3) Require entities that receive geothermal royalties to submit an annual report to the Legislature. **Although the Department of Land and Natural Resources (Department) supports the intent of geothermal exploration in general, the Department opposes the language in the current draft of the measure and offers amendments.**

The measure as written would deprive the Department of most if not all of the geothermal royalties it currently receives. As the Department bears all costs for regulating geothermal resources, and processing and management of geothermal leases, the measure as currently drafted gives the Department last priority to receive geothermal royalties. The Department believes that is unfair and unduly burdensome. If the Department cannot cover its costs from the royalties it received, it will no longer process any new geothermal leases.

Currently, the Department is tasked with handling all of the leasing, lease management duties, and regulation of geothermal mining. In exchange, the State receives 50% of the geothermal royalties while the remaining proceeds are allocated as follows: 30% to the County of Hawaii, and 20% to the Office of Hawaiian Affairs (OHA) which represents its pro rata share of ceded land revenues. The Department understands that if the Hawaii Geothermal Exploration Special Fund were to receive any excess revenues, it would be responsible for paying the portion of OHA's pro rata share for any revenues received. The Department would be responsible for

**SUZANNE D. CASE**  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

**ROBERT K. MASUDA**  
FIRST DEPUTY

**M. KALEO MANUEL**  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

payment of OHA's pro rata share only for revenues received by the Special Land Development Fund (SLDF) under the cap proposed by this measure.

The revenues from public lands, including the geothermal royalties, are deposited into the SLDF and funds the entire annual operating budget for the Department's Land Division, the Office of Conservation and Coastal Lands, and the Dam Safety Program in addition to the Mineral Resources Programs as noted previously. These revenues also fund over 80 Department staff positions, including 5 positions within the Commission on Water Resource Management, and provide funding support to the Division of State Parks and various resource protection programs administered by the Division of Forestry and Wildlife such as the protection of threatened and endangered species, removal of invasive species, wildland firefighting and lifeguard services. Revenues collected by other divisions have supported watershed protection, preservation of cultural and historical sites and public recreational resources. If geothermal royalties are not sufficient to cover the operating costs of the Mineral Resources program, then SLDF monies from other sources will subsidize geothermal regulation at the expense of other public trust resource management, protection and public health and safety programs.

If a cap of the Department's share of geothermal royalties is necessary, we believe an interim annual cap of \$1,500,000<sup>1</sup> would be necessary to cover the complex regulatory and geothermal mining lease management duties. The Department further notes that it is imperative that it retain a portion of geothermal royalties sufficient to support the Mineral Resources program that regulate geothermal development and dispositions. Additionally, staff costs are incurred for geothermal lease management, such as covering Land Division staff, billing, collection, annual insurance monitoring, or any of the other Department staff that will be called upon to assist a new applicant for a geothermal lease. Also, appraisal costs for special dispositions like geothermal are significant, plus substantially more if mediation and arbitration would be required under Section 171-17, Hawaii Revised Statutes (HRS). Furthermore, the Department believes that any revenues received by the University of Hawaii Geothermal Exploration Special Fund should not exceed \$1,500,000 annually. In the event excess royalties eligible to be paid to the fund exceeds that amount, the excess should be returned to the SLDF to further support geothermal resource regulation development and leasing.

In order to ensure that the Department receives adequate funding for regulation and disposition of geothermal resources, the Department believes that it should have first priority to receive royalties. The Department recommends the following amendment effectuating that objective by omitting SECTIONS 2 and 3 and by amending Section 182-7(c), HRS, to read as follows:

"(c) The payments to the State as fixed by the board shall be specified; provided that:

- (1) In the case of bauxite, bauxitic clay, gibbsite, diaspore, boehmite, and all ores of

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<sup>1</sup> In the event additional mining leases are issued or the Department's staffing and workload increases, the Department may need to seek an adjustment upwards on this interim annual cap.

aluminum, the amount of royalties for each long dry ton of ore as beneficiated shall not be less than twenty-five cents or the equivalent of the price of one pound of virgin pig aluminum, whichever is higher, nor shall it exceed the equivalent of the price of three pounds of virgin pig aluminum;

- (2) The rate of royalty for ore processed into aluminous oxide in the State shall be set at eighty per cent of the rate of royalty for ore not processed to aluminous oxide in the State; ~~and~~
- (3) The royalty shall be fixed at a rate that will tend to encourage the establishment and continuation of the mining industry in the State~~[-]~~ and
- (4) Any other law to the contrary notwithstanding, and subject to the Hawaiian Homes Commission Act of 1920, as amended, and section 5(f) of the Admission Act of 1959, all royalties received by the State from geothermal resources shall be distributed in the following priority:
  - (A) Fifty per cent of royalties up to an amount not to exceed \$1,500,000 annually shall be paid into the special land and development fund, pursuant to section 171-19;
  - (B) Thirty per cent of royalties up to an amount not to exceed \$600,000 annually shall be paid to the county in which mining operations covered under a state geothermal mining lease are situated;

- (C) Any excess royalties shall be deposited in the Hawaii geothermal exploration special fund according to section § , as amended, up to an amount not to exceed \$1,500,000 annually, and provided that any royalties exceeding that amount shall be deposited into the special land and development fund; and
- (D) Provided that if the geothermal resources are located on lands under the jurisdiction of the department of Hawaiian home lands, one hundred per cent of royalties received by the State shall be paid to the department of Hawaiian home lands.

The prices of virgin pig aluminum for the purpose of determining the royalties under this section shall be the basic price on the mainland United States market for virgin pig, not refined, f.o.b. factory. The royalties shall be in lieu of any severance or other similar tax on the extracting, producing, winning, beneficiating, handling, storing, treating, or transporting of the mineral or any product into which it may be processed in the State, and shall not be subject to reopening or renegotiating for and during the first twenty years of the lease term.

If the lessee desires to mine other minerals, the lessee, before mining the minerals, shall notify the board in writing, and the board and the lessee shall negotiate and fix the royalties for the minerals.

~~[Any other law to the contrary notwithstanding, thirty per cent of all royalties received by the State from geothermal resources shall be paid to the county in which mining operations covered under a state geothermal resource mining lease are situated; provided that if the geothermal resources are located on lands under the jurisdiction of the department of Hawaiian home lands, one hundred per cent of royalties received by the State shall be paid to the department of Hawaiian home lands.] "~~

The Department believes this proposed language accomplishes the same goals of this measure.

Also, with regards to SECTION 1 of this measure, the Department recommends that in lieu of creating a new section of law requiring annual reports to the Legislature, Section 182-18(c), HRS should be amended to read as follows:

"(c) The board shall submit a written report of all geothermal royalty dispositions to the legislature in accordance with section 171-29. Additionally, each county in which mining operations covered under a state geothermal resource mining lease are situated shall submit an annual report to the legislature regarding the use of the distributed geothermal royalties no later than twenty days prior to the convening of each regular session."

Finally the Department notes that SECTION 1 of this measure proposes to create the Hawaii Geothermal Exploration Special Fund which would not be under the control of the Board of Land and Natural Resources. Accordingly, the Department suggests the creation of this special fund, and its reporting requirements to the Legislature, be established under Title 18, Chapter 304A, HRS, which is the appropriate body of law for the University of Hawaii System. Additionally, the purpose of the bill under SECTION 1 is to "further the discovery and development of geothermal resources." The Department notes that term "discovery" is not defined in Section 182-1, HRS.

Thank you for the opportunity to testify on this measure.

**SB-3229-SD-2**

Submitted on: 3/13/2022 11:15:18 PM

Testimony for EEP on 3/15/2022 9:00:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Testify</b>
Ian Hirokawa	DLNR	Oppose	Remotely Via Zoom

Comments:

I am available for questions to DLNR. Please allow me Zoom access.

**SB-3229-SD-2**

Submitted on: 3/13/2022 11:16:15 PM

Testimony for EEP on 3/15/2022 9:00:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Testify</b>
James Kurata	DLNR	Oppose	Remotely Via Zoom

Comments:

I am available for questions to DLNR. Please allow me Zoom access.



# UNIVERSITY OF HAWAII SYSTEM

## Legislative Testimony

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Testimony Presented to the  
House Committee on Energy & Environmental Protection  
Tuesday, March 15, 2022 at 9:00 a.m.

by  
Vassilis L. Syrmos  
Vice President for Research and Innovation  
University of Hawai'i System

### SB 3229 SD2 – RELATING TO GEOTHERMAL ROYALTIES

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

The University of Hawai'i (UH) is in support of SB 3229 SD2, 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.

Thank you for the opportunity to testify in support of this measure.





# HAWAII STATE ENERGY OFFICE STATE OF HAWAII

DAVID Y. IGE  
GOVERNOR

SCOTT J. GLENN  
CHIEF ENERGY OFFICER

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Testimony of  
**SCOTT J. GLENN, Chief Energy Officer**

before the  
**HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION**

Tuesday, March 15, 2022  
9:00 AM  
State Capitol, Conference Room 325 & Via Videoconference

**COMMENTS  
SB 3229 SD2  
RELATING TO GEOTHERMAL ROYALTIES.**

Chair Lowen, Vice Chair Marten and Members of the Committee, the Hawai'i State Energy Office (HSEO) offers comments on SB 3229, SD2, 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, establishes the University of Hawai'i Geothermal Exploration Special Fund for 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.

HSEO's comments are guided by its mission to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient, clean energy, decarbonized economy. HSEO believes geothermal energy can play a significant role in achieving 100% renewable energy generation statewide and supports incentives for its development. Royalties from geothermal development play an important role in its regulation and the administration of state and county programs related to geothermal. HSEO defers to the appropriate agencies for comment on the fiscal, administrative, and regulatory impacts.

Thank you for the opportunity to testify.

DAVID Y. IGE  
GOVERNOR



CRAIG K. HIRAI  
DIRECTOR

GLORIA CHANG  
DEPUTY DIRECTOR

**STATE OF HAWAII**  
**DEPARTMENT OF BUDGET AND FINANCE**  
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EMPLOYEES' RETIREMENT SYSTEM  
HAWAII EMPLOYER-UNION HEALTH BENEFITS TRUST FUND  
OFFICE OF THE PUBLIC DEFENDER

ADMINISTRATIVE AND RESEARCH OFFICE  
BUDGET, PROGRAM PLANNING AND  
MANAGEMENT DIVISION  
FINANCIAL ADMINISTRATION DIVISION  
OFFICE OF FEDERAL AWARDS MANAGEMENT (OFAM)

**WRITTEN ONLY**  
TESTIMONY BY CRAIG K. HIRAI  
DIRECTOR, DEPARTMENT OF BUDGET AND FINANCE  
TO THE HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION  
ON  
SENATE BILL NO. 3229, S.D. 2

**March 15, 2022**  
**9:00 a.m.**  
**Room 325 and Videoconference**

RELATING TO GEOTHERMAL ROYALTIES

The Department of Budget and Finance (B&F) offers comments on this bill.

Senate Bill (S.B.) No. 3229, S.D. 2, caps the amount of royalties from geothermal resources that are paid to the State and county and establishes the University of Hawai'i Geothermal Exploration Special Fund (GESF) for the Hawai'i Groundwater and Geothermal Resources Center to further the discovery and development of geothermal resources; and pays 100% of royalties received by the State on lands under the jurisdiction of the Department of Hawaiian Home Lands (DHHL) to DHHL. This bill also requires an annual report to the Legislature.

As a matter of general policy, B&F does not support the creation of any special fund which does not meet the requirements of Section 37-52.3, HRS. Special funds should: 1) serve a need as demonstrated by the purpose, scope of work and an explanation why the program cannot be implemented successfully under the general fund appropriation process; 2) reflect a clear nexus between the benefits sought and charges made upon the users or beneficiaries or a clear link between the program and

the sources of revenue; 3) provide an appropriate means of financing for the program or activity; and 4) demonstrate the capacity to be financially self-sustaining. Regarding S.B. No. 3229, S.D. 2, it is difficult to determine whether the GESF would be self-sustaining.

Thank you for your consideration of our comments.

**SB-3229-SD-2**

Submitted on: 3/13/2022 5:28:13 AM

Testimony for EEP on 3/15/2022 9:00:00 AM

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

Comments:

Geothermal energy production benefits the people of Hawaii because geothermal energy can offer the following:

- Lower the cost of electricity
- Greatly reduce carbon emissions involved with creating energy
- Generate revenues for the betterment of Native Hawaiians
- Increase the self-sustainability of the Hawaiian islands and reduce the import of oil
- Create local professional jobs

Currently, the Kilauea East Rift Zone (KERZ) on Hawaii Island is the only geothermal system in the Hawaiian archipelago from which geothermal electric power is being produced. Preliminary research by the Hawaii Groundwater and Geothermal Resources Center (University of Hawaii at Manoa) shows that all of the major Hawaiian Islands hold geothermal potential and that much of Hawaii's geothermal resources is unknown. Funding is needed for further geothermal exploration.

Demonstrating the geothermal resource requires a huge financial investment and multiple surveys (e.g., geophysical surveys, thermal gradient holes, full-size diameter drilling well). Each of these activities costs \$1 million or more, resulting in a \$5-to-10 million cost to demonstrate a geothermal resource. In Hawaii, drilling a well to confirm a geothermal resource alone costs over a million dollars.

Geothermal can provide baseload power, or the minimum amount of power that a utility company must generate for its customers. Baseload power not only ensures reliability of the electricity grid, but also reduces the cost of renewable energy. Unlike solar and wind energy, geothermal energy does not depend on favorable weather conditions and produces electricity continuously--24 hours a day, 7 days a week. Because geothermal energy is stable and predictable, it enables accurate energy planning and can meet the minimum level of demand on an electrical grid during a twenty-four-hour period.

Geothermal also holds an advantage of its capacity factor, the ratio of actual energy output to possible energy output. The capacity factor indicates how fully and reliably a unit's capacity is used. Out of all renewable energy sources, geothermal provides the highest capacity factor. Modern geothermal power plants deliver a capacity factor upwards of ninety-to-ninety-five percent.

Geothermal will also help the state of Hawaii reduce carbon emissions. Compared to fossil-fuel power plants, geothermal power plants of similar size emit 97 percent less sulfur compounds that cause acid rain and about 99 percent less carbon dioxide. Recently, the Hawaiian Electric Company announced that its climate action plan to cut carbon emissions. Hence, HECO plans to expand geothermal resources.

Historically, Hawaii has had the highest electricity price in the nation. This price currently more than doubles the national average and adds to Hawaii's high cost of living. With Hawaii's volcanism, limited landmass, and fragile natural resources, geothermal can serve as Hawaii's only cost-effective, base-load renewable energy source. Out of all power sources, geothermal uses the least amount of land and can help the state to reach its 100% renewable source mandate by 2045.

**SB-3229-SD-2**

Submitted on: 3/13/2022 9:57:19 PM

Testimony for EEP on 3/15/2022 9:00:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Testify</b>
Richard Ha	Sustainable Energy Hawaii	Support	Written Testimony Only

Comments:

Dear Chair Lowen, Vice-Chair Marten, and committee members,

Sustainable Energy Hawaii is in support of SB3229 SD2. This will establish funding for the Hawai'i Groundwater and Geothermal Resources Center to continue its research into geothermal energy.

More than ever, we need to eliminate our dependence on fossil fuels. Geothermal energy will augment other renewable energy sources and offer a limitless heat source to enable our energy resilience and independence. Additional research is needed to identify different locations for future geothermal energy plants, and this funding will facilitate this.

Thank you for this opportunity.

Richard Ha

Chair - Sustainable Energy Hawaii

**SB-3229-SD-2**

Submitted on: 3/14/2022 8:09:52 AM

Testimony for EEP on 3/15/2022 9:00:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Testify</b>
Noel Morin	Individual	Support	Written Testimony Only

Comments:

Dear Chair Lowen, Vice-Chair Marten, and EEP committee members,

I support SB3229 SD2, a measure that will enable important research into our geothermal energy potential. The Hawai'i Groundwater and Geothermal Resources Center (HGGRC) has made good progress in studying the State's geothermal energy. Sustained funding will enable this organization to expand its efforts.

I believe geothermal energy will play an essential role in our economy and energy security. However, we need to figure out strategies to ensure that future development is consistent with environmental, social, and economic goals. With sustained funding, the HGGRC will contribute information that will help define these strategies.

Thank you for this opportunity.

Noel Morin - Climate Action Advocate, Hilo

As the Director of the Hawaii Groundwater and Geothermal Resources Center (HGGRC), I strongly support SB 3229.

Renowned groundwater expert Donald Thomas and I founded HGGRC in 2014. HGGRC provides and discovers information relating to groundwater and geothermal resources in Hawai'i. HGGRC endorses geothermal as a powerful baseload renewable energy that can enable Hawai'i to safely achieve its clean energy goals. We envision a sustainable Hawai'i that practices responsible and active stewardship over natural resources and promotes evidence-based energy and management policies that protect the people, land, and future of the islands.

Since producing Hawaii's first geothermal well (HGP-A) in the 1970s, the University of Hawaii (UH) has served as a leader in Hawaii geothermal research. UH contributed to a statewide geothermal resource assessment during the mid-1980s. In 2013, with funding from the U.S. Army, the HGGRC team led a drilling effort in search of groundwater. This effort found water at an elevated temperature (~140 °C) in a location not previously recognized as a geothermal area of interest. This discovery not only expanded our state's resource potential but also demonstrated that our understanding of Hawaii's geothermal resource potential is limited.

For its most recent geothermal research effort, HGGRC executed a statewide geothermal resource assessment funded by the U.S. Dept of Energy. I led this \$2.3 million project, which identified prospective geothermal resources on each of the main Hawaiian Islands. As Hawaii is the only U.S. state without an official geological survey, UH has historically contributed a huge bulk of what we know about Hawaii's geology. The technical leader of Hawaii's previous (1985) statewide geothermal resource assessment, Dr. Donald Thomas contributed his decades of experience in Hawaii geothermal research to the recent project.

Currently, the Kilauea East Rift Zone on Hawaii Island is the only geothermal system in the Hawaiian archipelago from which geothermal electric power is being produced. Operated by Ormat Technologies, Inc., the Puna Geothermal Venture (PGV) produced up to 38 MWe before the Kilauea eruption and now produces ~25 MW as of October 2021. To create electric power, PGV uses >300 °C fluids at depths of up to 2.5 km. Prior



to Kilauea's 2018 eruption, PGV provided ~30% of Hawaii Island's and ~3% of the state's energy needs. Other than PGV and the Puna area, the major Hawaiian Islands have very few deep (~2 km) wells. Therefore, from a geothermal perspective, the remainder of Hawaii is largely unexplored. Nonetheless, analyses of shallow groundwater and geophysical data indicate a presence of geothermal resources across the state.

Geothermal resources will serve as a key element for Hawaii's success in achieving its 100% renewable goals, as noted by HECO's recent RFP calling for 500-700MW of firm energy for Oahu. The State's total electricity use is ~2,000 MW, and a 2005 study by Geothermix Inc. estimated geothermal potential within Hawai'i Island and Maui at 1,535 MW (likely an underestimation). As another benefit, geothermal energy production in Hawaii has provided millions of dollars of royalties to the County of Hawaii, Office of Hawaiian Affairs, and the Department of Land and Natural Resources.

Our research has shown that all of the major Hawaiian Islands hold geothermal potential and that the resources outside of Kilauea's East Rift Zone remain to be validated. The funding we receive will be focused on this exploration and validation. Thank you for considering SB 3229.