

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



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

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HONOLULU, HAWAII 96809

**Testimony of
WILLIAM J. AILA, JR.
Chairperson**

**Before the House Committees on
ENERGY & ENVIRONMENTAL PROTECTION
and
WATER & LAND**

**Thursday, February 13, 2014
8:40 A.M.
State Capitol, Conference Room 325**

**In consideration of
HOUSE BILL 2359
RELATING TO THE ENVIRONMENT**

House Bill 2359 proposes to prohibit hydraulic fracturing and the collection, storage, treatment, or discharge of wastewater from hydraulic fracturing, and provides for penalties and enforcement. **The Department of Land and Natural Resources (Department) opposes this measure for the following reasons:**

To date, there has not been any hydraulic fracturing conducted in the State of Hawaii. The Department is not aware of any expressed interest to conduct hydraulic fracturing.

If a developer proposes to conduct hydraulic fracturing, the Department would require a well drilling or modification permit and disclosure in the developer's Plan of Operation, both of which would require approval by the Department.

If a developer were to propose to conduct hydraulic fracturing, this action would need to be disclosed in an Environmental Impact Statement (EIS), in accordance with Chapter 343, Hawaii Revised Statutes. The Department would not issue a permit for hydraulic fracturing until completion and acceptance of a final EIS.

The Department does not wish to prohibit the use of any future tools or methods which, if used properly, could help Hawaii's energy needs, including its Clean Energy Initiative goals.

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIA'AINA
FIRST DEPUTY

WILLIAM M. TAM
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

The Department recognizes the concern caused by the potential use of hydraulic fracturing, and if such a method were proposed, would take all necessary steps to ensure that it would adhere to all regulations to ensure public safety and the preservation of this public trust resource.

Thank you for the opportunity to testify on this measure.

COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION

Rep. Chris Lee, Chair

Rep. Cynthia Thielen, Vice Chair

COMMITTEE ON WATER AND LAND

Rep. Cindy Evans, Chair

Rep. Nicole E. Lowen, Vice Chair

Thursday February 13, 2014

Conference Room 325

8:40 AM

Testimony in Opposition to HB 2359

Prohibiting hydraulic fracturing in Hawaii

Submitted by:

Donald Thomas

I am a member of the research faculty at the University of Hawaii and have conducted applied and basic research on Hawaii's geology, groundwater, and geothermal systems for more than 40 years. I present the following testimony in opposition to **HB 2359**.

I oppose the passage of HB2359 in its current form for the following reasons:

1) Public, and apparently Legislative, concerns regarding hydro-fracturing are largely based on a technology that has been applied to a geologic environment that is fundamentally different from that in Hawaii, using methods, and for purposes, that are fundamentally different from those for which it might be applied in Hawaii;

2) In much of the public discussion, the impacts allegedly associated with application of this technology in Hawaii are based on conditions and processes that are not relevant to any potential application of hydro-fracturing technology in Hawaii's geology;

3) Should this technology ever be seriously contemplated for use in Hawaii, many, if not all, the adverse impacts of the use of hydro-fracturing, can be mitigated, if not completely eliminated, through proper regulation of the time, the place, and the methods of its application;

4) The bill, as currently written, doesn't adequately characterize the technology, nor does it specify sufficient limitations, that will prevent mis-application of the law to what are now ongoing and permitted processes in Hawaii.

Protection of the public, and our natural resources, are essential to the beneficial application of any new technology. We have a regulatory structure that is charged with that responsibility. Rather than banning the use of this technology, a more appropriate approach

is to direct those agencies responsible for protection of groundwater and regulating the installation and use of injection wells, the DLNR and DOH, to develop administrative rules applicable to hydro-fracturing and injection of fluids into underground formations.

Thank you for this opportunity to offer testimony.

This testimony reflects my views alone and is not an official statement of the University of Hawaii.



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

NEIL ABERCROMBIE
GOVERNOR

RICHARD C. LIM
DIRECTOR

MARY ALICE EVANS
DEPUTY DIRECTOR

No. 1 Capitol District Building, 250 South Hotel Street, 5th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804
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Statement of
RICHARD C. LIM
Director
Department of Business, Economic Development, and Tourism
before the
**HOUSE COMMITTEES ON ENERGY AND ENVIRONMENTAL PROTECTION
AND
WATER AND LAND**

Thursday, February 13, 2014
8:40 a.m.

State Capitol, Conference Room 325

in consideration of
HB 2359
RELATING TO THE ENVIRONMENT.

Chairs Lee and Evans, Vice Chairs Thielen and Lowen, and Members of the Committees.

The Department of Business, Economic Development, and Tourism (DBEDT) opposes HB 2359, which would prohibit hydraulic fracturing and prohibit the handling of waste fluids from hydraulic fracturing without a permit.

While public focus on hydraulic fracturing has been specific to the fossil fuel industry, issues of oil/gas leakage, injection of highly pressurized fluids, etc. do not apply to the only relevant application in Hawaii, geothermal drilling, since fracking is used in areas with hot, dry rock with poor permeability rather than the geological formations found in Hawaii. Therefore, this measure may create false impressions of unfounded risks to geothermal production in Hawaii.

Because all geothermal drilling is subject to regulation by the Department of Land and Natural Resources (DLNR), DBEDT defers to DLNR regarding the regulation of hydraulic fracturing, should it ever be proposed. Thank you for the opportunity to offer these comments in opposition to HB 2359.

HU'ENA



POWER

Bill: **HB 2359**

Committees: WTL/ENE, JDL

Hearing Date: February 13th, 2014

Hearing time: 8:40 am

Location: 325

Testimony in Opposition

Date: February 10th, 2014

Aloha Legislators,

Hu'ena Power is a Hawaii based geothermal development company majority owned by Native Hawaiians. The company was created to bring affordable electricity to the ratepayers of Hawaii Island via renewable, clean geothermal energy production utilizing an abundant, indigenous fuel source. Hu'ena Power has worked with industry experts from all over the world to assess both the transmission and generation of electricity here in Hawaii.

Hu'ena Power opposes this Bill because it is based on misrepresentations, is not supported by science & does not relate to geothermal or renewable energy in Hawaii.

Hu'ena has sought & obtained the written opinion of Doctor Sadiq Zarouk an internationally recognized authority on geothermal development, on the issue of Fracking in Hawaii. His qualification include:

2013- Elected Member of the Board of Directors, International Geothermal Association,

2011-2014 Elected Member of the Board of Directors, New Zealand Geothermal

Association (Head of the Education and R&D committee),

2001- 2014 Member of the Iceland Deep Drilling Project (IDDP)

2006-2009 Research Advisory Board Member for the Cooperative Research Centre for

Greenhouse Gas Technologies (CO2CRC), Australia., 2011-2014 Member of the Australasian

Association for Engineering Education (AAEE), 2001-2014, Member of the International

Geothermal Association (IGA).

Sincerely,

A handwritten signature in black ink, appearing to read "Roberta Cabral". The signature is fluid and cursive, with a large initial 'R'.

Roberta Cabral

Director, Hu'ena Power

(Attached: Civil Beat Article on Fracking)

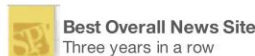
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County Bill 129 is Bad for Hawaii: Dispelling Myths About Fracking

By Sadiq Zarrouk | 10/28/2013

There is no shortage of information, misinformation and fears raised about hydraulic fracturing (fracking).

Some of the bad press around "fracking" has been well-earned. But the negatives surrounding its use by the oil and gas industries to improve the production of wells is threatening progress in places where there should be no anxiety about fracking.

Hawaii is one such place, judging by recent legislation attempting to preemptively exclude fracking from the urgent conversation about geothermal that is currently underway. As a scientist who works and lectures on geothermal issues and projects, I offer the following observations to help correct serious misconceptions and facilitate a more informed conversation about how to move Hawaii forward with regard to tapping its incredible geothermal resources.

1. Fracking is normally carried out after the completion of drilling. Fracking is NOT normally used/applied in conventional geothermal, which is the case for geothermal power development in New Zealand, Hawaii and another 22 countries around the world.
2. I can say with confidence that there is not going to be any fracking in future geothermal development in Hawaii.
3. Legislation such as Bill 129 that purport to be inspired by what other regions have done to protect against fracking should be based on facts. The UK, New Zealand and Canada cited in Bill 129 have NOT banned fracking. The UK did have a moratorium which was lifted in December 2012.
4. Water is used in great quantities while drilling new wells. But it is a temporary phase of two to three months and limiting its use will only inhibit efficient start-up operations.
5. Some limited use of chemicals for cleaning, improvement of permeability and prevention of mineral deposits inside the well may be necessary. This does not constitute fracking and may be necessary for the operation of the plant.
6. It is not prudent to give an administrator without the appropriate science and geothermal engineering expertise the power to shut down operations as this bill does. In New Zealand, the drilling inspector is someone trained to perform that function and has the necessary qualifications for it. Having an administrator without the relevant experience wielding that kind of power is not conducive to good decision-making or good business. It is therefore also not good for the community.
7. It is true that some drilling equipment can be used for fracking. However, an administrator who does not have a full understanding of geothermal operations may be empowered by this bill to shut down the site because he or she sees equipment that can be used for fracking even if there is no fracking taking place or being planned.
8. All the Hawaii islands are volcanic, so there are no likely hydrocarbons (Oil, Gas, Coal etc.) to be accessed using fracking. These are the industries that use fracking; not geothermal.

In my opinion, legislation like Bill 129, while well-intentioned, has been guided by bad information and an inadequate understanding of the industry. It will not serve Hawaii well and may seriously retard the development of a renewable energy source that could replace imported oil as the firm power base for the state's energy portfolio. That need is urgent and it would be a shame to see Hawaii's path to energy independence obstructed by this kind of ill-conceived legislation.

About the author: Sadiq Zarrouk is a Geothermal Reservoir Engineer and a Member of the Board of Directors of the International Geothermal Association. He has 17 years of experience in the field and has studied Hawaii's geothermal resources. He has published extensively in refereed journals and conference proceedings and run several advanced geothermal professional training courses. He consults for clients globally, including Innovations Development Group in Hawaii, Contact Energy in New Zealand, Arrow Energy in Australia and more.

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About the Author

Sadiq Zarrouk

Contributor



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Council Services Division
4396 Rice Street, Suite 209
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February 11, 2014

**TESTIMONY OF GARY L. HOOSER
COUNCILMEMBER, KAUA'I COUNTY COUNCIL
ON
HB 2359, RELATING TO THE ENVIRONMENT
Committee on Energy and Environmental Protection
Committee on Water and Land
Thursday, February 13, 2014
8:40 a.m.
Conference Room 325**

Dear Chair Lee, Chair Evans and Committee Members:

Thank you for this opportunity to submit testimony in support of HB 2359, prohibiting hydraulic fracturing in the State of Hawai'i. My testimony is submitted in my capacity as the Economic Development (Sustainability / Agriculture / Food / Energy) & Intergovernmental Relations Committee Chair and Councilmember of the Kaua'i County Council.

Hydraulic fracturing, also known as "fracking," is a technique to extracting natural gases well below the earth's surface. This process is widely developing across America and involves a great amount of water, sand, and chemicals which are mixed together and pumped underground to divide rocks, releasing the natural gases.

Until there is a clear understanding of what the health and environmental impacts are, the State of Hawai'i should move forward with prohibiting hydraulic fracturing in our islands, as it is government's responsibility to protect the health and well-being of our citizens.

For the reasons stated above, I encourage this Committee to unanimously pass HB 2359. Again, thank you for this opportunity to submit testimony.

Sincerely,

GARY L. HOOSER
Councilmember, Kaua'i County Council

AB:aa

HB2359

Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Luana Jones	Kanaka Maoli 'O Puna	Support	Yes

Comments: Please pass this pono (just), malama 'aina (take care of the land) bill to become law. Mahalo for being wise stewards of the sacred land. Ho'opomaika'i Kakou - Blessings!

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

Do not reply to this email. This inbox is not monitored. For assistance please email webmaster@capitol.hawaii.gov



Indigenous Consultants, LLC

Mililani B. Trask, Principal

P.O.Box 6377 ❖ Hilo, HI 96720

Mililani.trask@gmail.com



HB 2359

Senate Committees: EEP/WAL

Hearing Date: February 13th, 2014

Time: 8:40 am

Room: 325

TESTIMONY IN OPPOSITION

Date: February 10th, 2014

Aloha Legislators,

Indigenous Consultants (IC) is a Hawaii based, indigenous LLC owned and operated by Native Hawaiians. It was created to assist indigenous peoples in developing their renewable energy resources in ways that are: Culturally appropriate, environmentally green and sustainable, socially responsible and economically equitable and affordable. For several years the IC has worked with Innovations Development Group in New Zealand and indigenous Maori developing geothermal resources, which are trust assets of Maori Land Trusts. In addition, the IC has acted as a consultant to other indigenous people in Hawaii and Asia who are addressing development of their trust renewable energy resources in ways that; directly benefit their people, bring in revenues, create small business opportunities and ensure fair & affordable rates to consumers, including themselves and their communities.

IC strongly oppose this measure because it does not relate to geothermal development in Hawaii, is costly and is being proposed to generate fear & hysteria relating to a technology that simply is not being used, tested or considered for our State.

1. Hydrofracking is a technology generally used in the testing & production of oil & gas. There is no oil or gas in Hawaii.
2. No one is using hydrofracking in Hawaii & no one intends to. The proponents of this Resolution do not site any evidence of this because there is none.
3. Claims that Hawaii is currently "being assessed" as a potential site for this technology are false. Where is the evidence of this assertion in the Resolution? There is no evidence that this is occurring in Hawaii, and the possibility that this technology will be used in Hawaii are nil.
4. Claims that hydrofracking is being tested in Enhanced Geothermal Systems (EGS) and so are applicable in Hawaii are false & not substantiated by science or current research. EGS technology is not appropriate in Hawaii because Hawaii has volcanic soil that is permeable & Hawaii has significant rainfall. EGS applications are appropriate in the western continental USA

where there is little or no rain & no permeable soils.

THE FACTS RE: HYDROFRACKING & EGS ARE THE FOLLOWING:

A. The technique of hydraulic fracturing is used to increase or restore the rate at which fluids, such as petroleum, water, or natural gas can be recovered from subterranean natural reservoirs. Reservoirs are typically porous sandstones, limestone or dolomite rocks, but also include "unconventional reservoirs" such as shale rock or coal beds. Hydraulic fracturing enables the production of natural gas and oil from rock formations deep below the earth's surface (generally 5,000–20,000 feet (1,500–6,100 m)). At such depth, there may not be sufficient permeability or reservoir pressure to allow natural gas and oil to flow from the rock into the wellbore...

[See ^ "Hydraulic fracturing research study" (PDF). EPA. June 2010. EPA/600/F-10/002.Retrieved 2012-12-26.]

B. While the main industrial use of hydraulic fracturing is in arousing production from oil and gas wells, hydraulic fracturing is also applied for heat extraction to produce electricity in an enhanced geothermal systems in areas of the US with low rainfall & soils that are impermeable. This does not apply in HAWAII.

[See^ "Geothermal Technologies Program: How an Enhanced Geothermal System Works"..eere.energy.gov. 2011-02-16. Retrieved 2011-11-02 & Duchane article below.]

C. Research on the EGS applications of hydrofracking for geothermal development have already been assessed for the United States. Some States have been identified as areas for EGS however Hawaii IS NOT one of the States.

[See Duchane, Dave; Brown, Don (December 2002), "Hot Dry Rock (HDR) Geothermal Energy Research and Development at Fenton Hill, New Mexico", Geo-Heat Centre Quarterly Bulletin (Klamath Falls, Oregon: Oregon Institute of Technology) 23 (4): 13–19, ISSN 0276-1084, retrieved 2009-05-05.]

Lets stop wasting time with political games.

Please kill this measure.

Regards,



Mililani B. Trask
Indigenous Consultants, LLC

Dr. Zarrouk Civil Beat Article Attached

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Hawaii is one such place, judging by recent legislation attempting to preemptively exclude fracking from the urgent conversation about geothermal that is currently underway. As a scientist who works and lectures on geothermal issues and projects, I offer the following observations to help correct serious misconceptions and facilitate a more informed conversation about how to move Hawaii forward with regard to tapping its incredible geothermal resources.

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In my opinion, legislation like Bill 129, while well-intentioned, has been guided by bad information and an inadequate understanding of the industry. It will not serve Hawaii well and may seriously retard the development of a renewable energy source that could replace imported oil as the firm power base for the state's energy portfolio. That need is urgent and it would be a shame to see Hawaii's path to energy independence obstructed by this kind of ill-conceived legislation.

About the author: Sadiq Zarrouk is a Geothermal Reservoir Engineer and a Member of the Board of Directors of the International Geothermal Association. He has 17 years of experience in the field and has studied Hawaii's geothermal resources. He has published extensively in refereed journals and conference proceedings and run several advanced geothermal professional training courses. He consults for clients globally, including Innovations Development Group in Hawaii, Contact Energy in New Zealand, Arrow Energy in Australia and more.

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Sadiq Zarrouk

Contributor



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TO: The Honorable Representatives of The Energy and Environmental Protection Committee

Please accept this as a written request to review the merits of HB2359 to prohibit Hydraulic Fracturing in Hawaii. There have been at least 3 reputable government studies published in 2013 that correlate Hydraulic Fracturing or "Fracking" to earthquakes. This includes 2 in-depth studies of fracking in Geothermal energy wells.

1. A July 12, 2013 USGS study has confirmed forcing high pressure water into the Earth via Fracking can increase the number of induced earthquakes.
2. A July 27, 2013 study by the University of California – Santa Cruz confirmed the correlation between Geothermal Fracking and earthquakes.
3. A 2013 study by the Committee on Induced Seismicity Potential in Energy Technologies; Committee on Earth Resources; Committee on Geological and Geotechnical Engineering; Committee on Seismology and Geodynamics; Board on Earth and Sciences and Resources; Division on Earth and Life Studies; and National Research Council concludes Geothermal drilling causes earthquakes.

Some other issues to consider:

- The Geothermal plant in Puna has not reduced Hawaii County energy costs, despite the promise to Hawaii residents.
- Some (particularly those financially connected to the industry) will try to distance geothermal from fracking, however if pumping high pressure fluid into the earth fractures the rock, it is not good for Hawaii, period.
- If those same industry sources do not plan on fracturing the land, then they should not be concerned with this bill.
- Hawaii has an abundance of sun, wind and biofuel opportunity, and these are truly clean, environmentally friendly, renewable energy solutions.

In summary, HB2359 is an insurance policy to protect our fragile Aina, and fracking is overwhelmingly not supported by Hawaii citizens.

Your review and passage of this important bill is truly very much appreciated.

Respectfully,
Mike Hasselle
MoveOn Honolulu Council
MoveOn has over 38,000 members in Hawaii

Bill: **HB 2359**

Committees: EEP/WAL

Hearing Date: Thursday, February 13th, 2014

Hearing time: 8:40 am

Location: 325

Monday, February 10, 2014

Testimony in Opposition

Aloha Legislators,

The Innovations Development Group (IDG) is a Hawaii based renewable energy Development Corporation owned by Native Hawaiians. It was created to facilitate the development of renewable energy resources of native people, and in summer 2011 presented its development model to legislators of the Energy & Land Committees.

IDG strongly opposes this measure. “Fracking” is not being tested or utilized in Hawaii. Fracking is a process used in gas & oil extraction, not for geothermal development.

For the past several years’ opponents of geothermal development claiming that “Fracking” is being tested in Hawaii and will be used for geothermal development have generated a campaign of misinformation & fear. This is false. The goal of this misinformation effort is to stop geothermal from progressing.

If you review testimony on this bill & others like it in 2013 & 2014, you will find that none of the testimony submitted actually provides any real examples or evidence in Hawaii. Last year, Life of the Land claimed that 21 geothermal developers bidding on the HECO RFP for Hawaii island were using Fracking – however when asked to provide the names of these companies, Life of the Land was unable to comply because there was none.

Last session, the proponent of this measure, Senator Russell Ruderman, tried to get the Honolulu Civil Beat to run an article on the dangers of Fracking in Hawaii. When CB asked him to name the companies using Fracking, he was unable to identify a single company. Instead he admitted his bill was a ‘pre-emptive’ move against geothermal & that he had deliberately left out the term ‘geothermal’ because he is known to be an opponent of this bountiful renewable source of energy! See **Lawmaker Raises Alarm About Geothermal Fracking in Hawaii** By [Sophie Cocke](#), Honolulu Civil Beat 01/30/2013.

Hawaii is not the only State addressing the energy crisis. California, a State with geothermal, oil and gas is currently debating the options. Attached is an article from the Sacramento Bee, it was written by the geothermal experts at the University of California at

Davis. They support geothermal development rather than gas and oil for the very reason that geothermal development does not use fracking.

Sincerely,

A handwritten signature in black ink that reads "Patricia K. Brandt". The signature is written in a cursive style with a large, looped initial "P".

Patricia K. Brandt

html
THE SACRAMENTO BEE sacbee.com

Viewpoints: Drill for energy? Yes, for more geothermal

Special to The Bee

Published Thursday, Aug. 01, 2013

The age of natural gas fracking is upon us, and the debate about how hydraulic fracturing will be done in California has begun. Even assuming conservative estimates of natural gas reserves in the lower 48 states, the United States could easily move from a coal-based electrical portfolio to one that is based on natural gas. So why invest in renewable energies when natural gas is so cheap and for the time being, plentiful? The answer is multifaceted, but we will focus on two reasons: cost and greenhouse gas emissions.

First, there is an indisputable need to reduce greenhouse gas emissions. That is why California is requiring 33 percent of electricity be generated by renewable energy by 2020. The Renewable Portfolio Standard also calls for an 80 percent reduction in greenhouse gases from 1990 levels by 2050. By becoming more reliant on natural gas for power generation, emissions may be saved, as natural gas burns cleaner. But natural gas is still a carbon-based and finite resource that will continue to contribute to the very issue these statutes are trying to address.

Further, the increased domestic production of natural gas will mainly go toward exports for international markets such as Europe and China, where consumers pay roughly three to five times what we do. The infrastructure for the export of liquefied natural gas, or LNG – the pipelines, treatment and conversion facilities, storage tanks, container ships – is already being put in place. Once LNG becomes a globally traded commodity, the price of domestic natural gas will inevitably rise. So we will have built the infrastructure that depends on it domestically and abroad, further increasing electricity and transportation costs.

Simply put, any finite resource that has price volatility and building infrastructure to support it leaves few options on the table when supplies run low or the price runs high, as we have seen in the transportation sector and the electrical sector with coal.

Here in California, our Renewable Portfolio Standard mandates that, by 2020, 33 percent of electrical generation from our public utilities must be from renewable energy sources, including solar, wind and geothermal – all of which have no fuel costs and all of which have close to zero carbon emissions.

Cheap natural gas is positioned in the market to fill much of the remaining 66 percent, especially as gas-fired power plants are flexible and can provide most of the electricity we need. Solar and wind could help with much of the remaining 66 percent, but we will need another source of power at a high level of penetration to offset their variability – when the sun isn't shining and the wind isn't

blowing.

Enter geothermal energy, using the natural heat within the Earth's interior for generating electrical power. In places where the temperature exceeds 375 degrees at depths of a mile or so – and we already know where a lot of these are in California – we can drill for deep fluids that have already mined the heat from the rocks they flow through. When that pressurized hot water is tapped, it flashes to steam that can power a turbine for electrical generation. Newer technology allows us to run the steam through heat exchangers, so that virtually all the fluid can be condensed and pumped back into the geothermal reservoir.

California currently leads the world in power production from geothermal energy. For many years our state has produced more geothermal power than any country. From the coastal mountains of Northern California to the Imperial Valley, geothermal power plants supply more than 2,700 megawatts of electricity, enough to power the homes of about 2.5 million Californians.

So why aren't we developing more geothermal energy to fulfill the requirements of the Renewable Portfolio Standard? The upfront costs – especially for drilling wells – for developing power production from geothermal energy are generally greater than those for other renewables. But once in operation, geothermal power plants deliver energy at a competitive rate with coal, wind and solar. They are also capable of generating electrical power for decades: The Geysers in Sonoma County recently celebrated its 50th anniversary of power production.

Moreover, the latest technology developments in geothermal power production will give us greater flexibility with the ability to ramp up and down with demand. That will help meet the growing need for energy production in California.

So let's change the debate: It shouldn't be just about whether we should be drilling – and fracking – for more natural gas. Let's ask why we aren't doing more drilling for another of California's golden resources, geothermal energy – which doesn't require fracking and doesn't have the myriad environmental consequences that come with natural gas.

Peter Schiffman is a geology professor emeritus at the University of California, Davis. William Glassley is the director of the California Geothermal Energy Collaborative at UC Davis. Elise Brown is the associate director.

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HB2359

Submitted on: 2/8/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Bill Smith	Individual	Support	No

Comments: I strongly support a prohibition of geothermal fracking in Hawai`i. A January 2013 Civil Beat report said, "Susan Petty, president of Seattle-based AltraRock Energy, says that geothermal fracking ... involves a technology called hydro-shearing ... water is pumped down wells into the reservoir to expand existing cracks ... She said her company considered bidding on a project in Hawaii, but likely won't because it doesn't own the land needed to conduct an operation." Alta Rock, the world's #1 geothermal fracking company, said they could have a bid in the HELCO geothermal RFP if they had the land. Don Thomas has referred to geothermal fracking as a worthy technology and is doing research that seems related to it, as noted in the same article: "He is currently leading a team of university researchers and scientists from the Lawrence Berkeley Lab, to study whether there are lower-intensity geothermal resources that can be tapped throughout the state.... Thomas said he doesn't understand why [Senator Russell] Ruderman would want to try to close off geothermal development that could help power Hawaii's energy needs before there are any proposals." Just Google geothermal fracking to find numerous reasons why it should be prohibited (induced seismicity, water consumption, etc.)

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Ashina Ashina	Individual	Support	No

Comments: There are numerous recent government studies that conclude fracking induces earthquakes, including geothermal fracking.

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HB2359

Submitted on: 2/8/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Katarina Culina	Individual	Support	No

Comments: Aloha Committee Chair, Vice Chair and Members, Please support HB2359 relating to Fracking. Experience of mainland communities that are having their land fracked has shown: dangers of well water/aquifer contamination, triggered seismicity, enormous amounts of water use and failure of government agencies to regulate the industry that uses fracking, to name a few. Please be proactive in protecting public's health and safety, as well as our environment's. Mahalo! Katarina Culina P.O. box 2142 Paho, HI 96778

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HB2359

Submitted on: 2/8/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Javier Mendez-Alvarez	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Theodore Banta	Individual	Support	No

Comments: I am in strong support of HB2359 (Ban Fracking).

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Andrea Rosanoff	Individual	Support	No

Comments: I truly hope you will support the important bill for Hawaii, HB2359 and its companion bill, SB2940 - the anti-fracking bills. Fracking is VERY water intensive, and in fact the magazine publication of the American Chemical Society (Chemical & Engineering News) spelled out in a recent comprehensive article that worldwide fracking activities will indeed run in to the coming water shortage for human existence. We don't need that kind of pressure in Hawaii. Let's just not even start it. You don't want to have to make future decisions on a large fracking operation vs. water needs of your constituents. Hawaii does not need fracking now, and probably never will. Let's not go there. Thank you for passing this sane and "preventive" legislation. I know you will do the right thing for Hawaii's future. A. Rosanoff, Ph.D. 13-1255 Malama St. Pahoa, HI 96778 808-965-7061

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HB2359

Submitted on: 2/8/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Mary Regina Miller	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
joy cash	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Christopher Biltoft	Individual	Support	No

Comments: The consequences of hydraulic fracturing on the slopes of one of the world's most active volcanoes are at best unknown and could be disastrous. It is incumbent on proponents of this technology to prove that this procedure is safe and environmentally benign. Until then, fracking must be banned.

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Paul Kuykendall	Individual	Support	No

Comments: I support this bill which would ban Fracking in Hawaii. Geothermal Fracking has the following issues: • Water Use. Fracking and filling the geothermal reservoir can use hundreds of millions or billions of gallons of water. Geothermal fracking uses over many times the water of oil gas/well fracking. (An oil or gas well uses 3 to 8 million gallons in its lifetime, one geothermal well in Oregon will use 122 million gallons in two years) • Water Contamination. The fracking process can cause vertical cracking, contaminating the fresh water above the geothermal resource. Well blowouts, unlikely but common accidents, can also contaminate drinking water. • Earthquakes. Earthquakes have shut down several geothermal projects, sometimes permanently, and damage claims from earthquakes have been paid by other projects. It takes up to several months for earthquakes to subside after halting the EGS project. • Social, economic, and cultural impact on the community. Issues include truck and other traffic on narrow or busy roads, noise impact, creation of water shortages or degradation of water quality from over-use, unabated or abated release of hydrogen sulfide (a poisonous, foul smelling gas), potential steam and chemical plumes during flow testing, restricted access to public trails and paths, and the need for extensive road construction. For these reasons, I ask you to oppose Fracking and support this bill.

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HB2359

Submitted on: 2/8/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
pat gegen	Individual	Support	No

Comments: Too many concerns with this technology at this point...

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Patricia Blair	Individual	Support	No

Comments: Ban fracking in Hawaii! It is not a safe practice!

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Thomas Spring	Individual	Comments Only	No

Comments: I support HB2359.

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Scott Stoddard	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Susan Bambara	Individual	Support	No

Comments: I support this conservation bill Mahalo

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Robert ortman	Individual	Support	No

Comments: I support HB2359. The people of Hawaii and Kauai Counties have already banned fracking which has done nothing but destroy the aina throughout the U.S.

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Rosemarie Patronette	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
James Hedgecock	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Carol Janezic	Individual	Support	No

Comments: No to fracturing and geothermal fracturing. The risks are too great to our people, our water supplies, and our infrastructure. Fracturing and geothermal fracturing have been implicated in the increase of earthquakes. Let's use the safe technologies already available to us and protect our people and our aina.

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
John Gelert	Individual	Support	No

Comments: Please ban fracking in Hawaii! Even if there is no oil in Hawaii, ban this toxic type of mining for anything!

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Alex Karp	Individual	Support	No

Comments: I strongly support this bill.

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Eric Marantz	Village Green Society (Belly Acres), Kapono	Support	No

Comments:

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Lyn Howe	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Natasha	Individual	Oppose	No

Comments:

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Norris Thomlinson	Individual	Support	No

Comments: We have so many examples around the world of the devastation fracking wreaks on local landbases, from poisoned water tables to increased seismic activity to the clearing of fracking sites. The minimal potential benefit to Hawaii residents is drastically outweighed by the risks; we don't need to become another bad example of fracking impacts. We need to be proactive about protecting ourselves from outside corporate interests who don't care about sacrificing our land and our health for their own profit. Please pass this bill!

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Marie Fontana	Individual	Support	No

Comments: Solar and wind will satisfy our energy needs. Corporations will fight to poison our land and people. They are in for the \$, forgetting that what goes around, comes around.

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Sunny Savage-Luskin	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/10/2014

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Submitted By	Organization	Testifier Position	Present at Hearing
Robin Kaye	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Susan Douglas	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Steve Hirakami	Individual	Support	No

Comments: I strongly support this bill to prohibit "fracking" or hydraulic fracturing in the State of Hawaii. All one has to know is all the negative incidents that have occurred around the world to be able to support this ban. Please no fracking.

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Barbara Barry	Individual	Support	No

Comments: Please do Not allow any fracking on these Sacred Islands and in the Oceans surrounding them. This is un necessary and there are better ways to create energy without the dangerous poisons they use to inject into the earth. Why even consider fracking an island? Fracking is know to cause water, air and soil pollution as well as causing earthquakes. Please, NO fracking for any reason, ever, in the Hawaiian Island Chain! Protect these Sacred Islands for the next 100 generations! The Ancestors are watching us, make them proud!

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Javier Mendez-Alvarez	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
tia pearson	Individual	Support	No

Comments: We already have a water shortage and fracking will make it worse since it uses a lot of fresh water. Not only that, fracking will dump over 5000 toxic chemicals onto our fragile environment. More evidence is showing as well that fracking creates earthquakes.

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HB2359

Submitted on: 2/9/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Steve Sakala	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Michelle Matson	Individual	Support	No

Comments: I strongly support HB2359. Hawai'i cannot risk seismic instability nor can we afford toxins injected into our water table. Please pass this bill in the interest of the public safety, health and welfare.

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HB1766

Submitted on: 2/10/2014

Testimony for EEP on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Michelle Matson	Individual	Support	No

Comments:

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HB1766

Submitted on: 2/10/2014

Testimony for EEP on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Gina Franchini	Individual	Support	No

Comments: I strongly support this bill

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Harry Kim
471 Ho`okina Place
Hilo, Hawaii 96720

February 10, 2014

Testimony to:

House Committee on Energy & Environmental Protection

Rep. Chris Lee, Chair
Rep. Cynthia Thielen, Vice Chair

House Committee on Water & Land

Rep. Cindy Evans, Chair
Rep. Nicole E. Lowen, Vice Chair

**Thursday, February 13, 2014, 8:40 a.m., Conference Room 325
In consideration of HB2359
RELATING TO THE ENVIRONMENT**

Position: Strong support

I ask for your support for HB2359 that appropriately prohibits hydraulic fracturing, also known as fracking or enhanced geothermal. Please report on HB2359 with the favorable recommendation of your committees.

Geothermal fracking uses injected water pressure to break up dry, hot rock to create a large reservoir miles under the ground. Then water is pumped into the reservoir from external sources to be used as a substitute for the naturally occurring subsurface hot water that is used in conventional geothermal energy locales (such as in geothermal resource subzones previously designated by the board of land and natural resources.)

As you know, last year the County of Hawai`i enacted Ordinance 13-115 to accomplish a similar prohibition. The County law says hydraulic fracturing poses serious threats to Hawai`i Island's air, water, watersheds and aquifers, and the public health and safety, and refers to the fact that hydraulic fracturing is known to cause earthquakes.

Please add your support to the home rule position taken by our County.

Much Aloha,
Harry Kim

HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Nicki Conti	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Paula	Individual	Support	No

Comments: For the love of God, the Aina and the future of the entire planet and it's inhabitants please don't frack the Garden.

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HB2359

Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Sonia Wallman	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
penny s	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Suzanne Wakelin	Individual	Support	No

Comments: STRONG SUPPORT There are many cases of induced seismic events associated with the use of hydraulic fracturing technologies and specifically projects that are considered "enhanced geothermal" which use the same principles as hydraulic fracturing in the oil and natural gas industry. The National Academy of Sciences published a report in 2013 Induced Seismicity Potential in Energy Technologies which documents a number of cases worldwide in which enhanced geothermal projects have had to be shut down because of the induced earthquakes and concludes: "...Although induced seismic events associated with these energy technologies have not resulted in loss of life or significant damage in the United States, some effects have been felt by local residents and have raised concern about additional seismic activity and its consequences in areas where energy development is ongoing or planned. While scientists understand the general mechanisms that induce seismic events, they are unable to accurately predict the magnitude or occurrence of these earthquakes due to insufficient information about the natural rock systems and a lack of validated predictive models at specific energy development sites." The issue of induced seismicity is clearly of great concern in Hawai'i due to the unique geology of the islands and the associated risks of volcanic activity In addition, there are significant risks to pollution of the water table with the use of fracturing technologies and EGS in Hawai'i. There exist no protections to ensure that these new and experimental technologies do not cause irreparable harm to the 'aina and the people of Hawai'i. The debacle of HGP-A, the experimental Hawai'i Geothermal Project that was initiated by the UH and the USGS in Puna shows us that experimental technologies can cause significant harm. Please see the Final Report of the Geothermal Public Health Assessment commissioned by Mayor Kenoi which specifically expresses serious concerns about the problems associated with those experiments. None of the publications that are promoting EGS in Hawai'i include proper assessment of the potential dangers of these technologies, they simply focus on the potential benefits and the economics. PICHTR Hawaii Geothermal Assessment and Roadmap published in 2013 includes statements about the potential for getting Federal money for EGS experiments as well as loosening the regulatory system. Hawaii Renewable Energy Development Venture Technology Assessment Engineered Geothermal Systems concludes that it "...might be a good investment for Hawaii...". No mention is made of the potential devastation that may occur from these experiments. The risks of hydraulic fracturing to the unique geologic, geographic, and aquatic environment of Hawai'i are too great to leave this issue to chance.

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HB2359

Submitted on: 2/10/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Sherry Pollack	Individual	Support	No

Comments: Aloha I strongly support HB2359 prohibiting hydraulic fracturing and the collection, storage, treatment, or discharge of waste water from hydraulic fracturing, and urge you to pass this bill. Hydraulic Fracturing, known as 'fracking' threatens the air we breathe, the water we drink, and the communities we live in. Experience has shown from other communities subjected to fracking that it's not a matter of 'if' it's a matter of 'when' an accident will occur. There have been more than 1,000 documented cases of water contamination near fracking drilling sites around the country. Communities currently near drilling sites with fracking operations have ended up with a multitude of adverse impacts to their environment and health, including depletion of local water supplies, contamination issues, adverse impacts from discharge of hazardous waste water that contains radioactive substances and other toxic chemicals, increased seismic activity, as well as air and noise pollution issues. Not surprising, people who live in areas where fracking occurs also experience reduced property values. Please protect the health and safety of of the people of Hawaii and support this bill! Respectfully, Sherry Pollack

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HB2359

Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Lisa Kirbin	Individual	Support	No

Comments:

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Support of SB2940
Support of HB2359
Support of HB1766/Repeal 97

Oppose HB2639/HD1
Oppose SB2663
Oppose HB1584

Helene Love 982-6433
Helene Love 982-6433

Helene Love 982-6433
Helene Love 982-6433
Helene Love 982-6422

NO TO FRACKING IN HAWAII (don't let Big \$\$ decide—this is our home; our world). When you push this paperwork around, give special numbers, sign and file, be sure you are doing what is right for our environment and don't accept corporation lies—seek the truth and keep Hawaii, Hawaii. Just because governments sign papers doesn't make any of it law to me; we all are responsible for each other and our lands on earth. We know we have plenty of sun to work with.

Are the risks worth the gains? *Fracking* has too many risks and our small land mass and weak rift zones won't handle the *fracking* impacts. *Fracking* uses more intensity, chemicals, and there's greater risks to water and land. And don't ruin the Big Island for the sake of power for other islands.

Has Big Island ever had beginning to end “Standards of Operating Procedures” with input from professionals from all fields, even when **drilling** straight down into a volcano on Zone 1, yet alone, *fracking*. Even today, after hundreds of thousands of *fracking* sites around the world, there are still unforgivable mistakes made to environments and humans and **drilling** in Hawaii will be “hits and misses” that no scientist can predict on our porous hot lands. Check Pele lately?????!!!!

All the risks with **any type** of drillings should be identified, first, with “what if plans” in place!!! What can go wrong during earthquakes, eruptions, or blowouts? Who's responsible?

The *corporate fracking industry* lies to property owners, drills more holes and closer to homes than told, drills *under* private properties, destroys the land and entire towns, rivers, lakes, fish, livestock, soils for planting, water, air, and forces generations of family-owned property owners out of town, (while having to pay for and deal with major health issues caused by *fracking*).

Corps don't care about lives being destroyed. *Fracking* in Hawaii won't be any different. Look how long Puna residents have been trying to protect their mental and physical health and their proudly-owned properties, while having no laws in place. Again, *fracking* corps. run our gov. and changed the environmental laws to suit their toxic money, even to the point of talking BLM to give up millions of acres of Federally protected lands to this, presumably, “safe renewable energy.”

When was the last time the water/aquifers and soil was checked for all contaminants at existing PGV? Do so now, before any new drilling may take place.

Who's responsible for the total “clean-up/over-sight” of the existing PGV plant—when? If PUC/HELCO insists on drilling, can the existing plant be up-graded with more MW enhancement, instead of more drill sites having to take place? **Drilling** or *fracking* in the wrong place or too close to any existing fractures may cause much bigger impacts than anybody can predict.

No *fracking* for electricity; no *fracking* or **drillings** for electricity used by other islands. Elect. for B.I. only.

The *fracking* process includes hundreds of toxic chemicals; some chemicals new and unknown to science.

Fracking won't keep Hawaii's land, water, aquifers unaffected; **no matter what type of drilling**, there are toxins involved.

Know all chemicals used and being brought into Hawaii for any type of geothermal methods.

No *fracking* or **drilling** that involves drilling underneath others properties

Drilling company finances (up-front) a fund to be used for any damages incurred to area and our roads. Safe *fracking* methods proposed by President Obama are not safe and they either lied to the public or

were being lied to while mainland drill sites were put in at an “unimaginable” alarming speed. Hawaii has no *fracking-trained* engineers/environmentalists and didn't even have their own hydrogen-sulfide meters to protect the citizens forced to live with this worry.

What pre-planning has been completed for the six geothermal contracts sitting with HELCO; shouldn't this be categorized as “Industrial,” versus residential, agriculture, and recreational? What will the drilling method be, certainly no newly disguised “proprietary” *fracking* name.

There can be no *fracking or drilling* involving the collection of any other earth elements.

City and County departments should receive monies from fracking company for water used, disposal of any environmental toxins (even tho' we know there won't be any), tearing down and cleaning site after use, payment for lawyers needed by residents if issues occur.

Drill in specific “Industrial Site” area far away from any housing areas; no more drilling in Puna (how about at the military PTA site, instead of preparing for killing wars). Better yet, contractors can pour their money and invent sun and wind energy at PTA and show a new positive direction for military use.

HB2359

Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Pua Kamaoa	Individual	Support	No

Comments:

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HB2359

Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Allan Reaves	Individual	Support	No

Comments: Ban ALL fracking PLEASE! Save our aina.

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Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
tj simms	Individual	Support	No

Comments:

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Testimony in support for HB 2359, Committee on Energy and Environmental Protection. Feb. 12, 2014

My name is Mary DeVincent, I am a registered voter in Hawaii and I strongly support HB 2359 to prohibit hydraulic fracturing and the collection, storage, treatment or discharge of wastewater from hydraulic fracturing.

I feel hydraulic fracturing is dangerous causing earthquakes and possibly polluting area wells. When drilling into the hot porous rock, they are unable to contain the direction of the cracks in the rock to prevent wells from being polluted. The drilling required the use of millions of gallons of water, a resource that should not be wasted to obtain energy; when there are other methods that do not use a valuable resource, water that is required for life. In addition, the many chemicals mixed with that water pollutes our land.

Another reason I support this bill is because of the blowouts that can occur during the operation of hydraulic fracturing. The dangerous chemicals such as hydrogen sulfide released by blowouts cause many health problems for the people living in the area. I have been in the area in Puna during a blowout with health consequences until I left the area. I feel there are safer ways to develop energy such as using solar power that should be used instead of this dangerous method.

I humbly request the Committee members to support and pass HB 2359 to protect the environment and the people of Hawaii. Thank you.

HB2359

Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Dave Kisor	Individual	Support	No

Comments: First and Foremost on the Order of Battle, fracking for anything on an island with limited resources is one of the most foolhardy things anybody could do, as it not only wastes the fresh water supply, it poisons whatever is left. Of course those responsible for this travesty do not live here, so that is not their personal problem, but for those who do live here, it is one of the bigger arguments against fracking (but for geothermal, they call it enhanced geothermal systems, like torture wasn't torture when it was an enhanced interrogation system). Another problem is earthquakes. A geothermal facility in Switzerland was shut down after it caused two high magnitude earthquakes. There is a very narrow band where geothermal energy can be extracted without using fracking and all other sites would require fracking. The authorization of this method would show an extremely low lack of regard for the citizens health, safety and well being. As for employment promises, the fracking school takes two years to complete, so the corporation would bring their own people from where ever and may hire a few locals, but that would not offset the devastating impact on our world. While it may work in other places, the geology is all wrong for Hawai'i.

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HB2359

Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Sara Steiner	Individual	Comments Only	No

Comments: Dearest Legislators, Please pass this bill immediately! Fracking has ruined great swaths of the mainland, and there is no way to reverse the damage. We do not need to do this to our islands, where we are already living on fractured land. It is not worth ruining our water supply and causing earthquakes, so that some big companies can make a profit. Thank you for supporting this bill!

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HB2359

Submitted on: 2/11/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Steve Sakala	Individual	Support	No

Comments:

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Thomas Lee Travis

RR 2 Box 3317

Pahoa, HI 96778

email: ttravis12@mac.com

mobile: (757) 639-7364

Testimony on HB 2359 for Hearing on February 13, 2014

To: Members of House Committees on Energy and Environmental Protection and Water and Land:

This testimony is in strong support of House Bill 2359 to ban hydraulic fracturing, hereafter referred to as fracking.

Some have said that there needs to be no state attention to fracking because there is no oil and gas in Hawai'i. Although it is certainly true there is no oil and gas in Hawaii, fracking to enhance development of geothermal resources is a possibility. Others have said that no one in Hawaii has declared an intent to frack while developing geothermal resources. But experience in California—where unregulated fracking and acidizing were practiced for many years before the State established a regulatory framework—would indicate that regulation should proceed fracking, not follow it.

Finally there are the lessons learned from the Gulf Oil Spill.

- Industry capability so far exceeded the capability of the regulators, the regulators had to rely on industry to know what was happening. The regulators could not understand what industry was doing.
- There was also a problem with regulatory capture. When the regulatory agency became incapable of regulating industry, the regulatory agency shouldered up to industry. Regulators became much more comfortable with those from industry than with those who raised questions about risk in industry actions.
- Regulatory incompetence and capture were exacerbated. The regulatory agency had the second task of collecting fees and taxes from industry, important money used in governmental budgets. As a consequence the regulatory agency was headed by a financial expert adept at collecting fees and taxes rather than an engineer that might have understood the industrial processes used.

Lessons from the Gulf Oil Spill and from lack of regulation in California demonstrate the importance of the State getting ahead of coming technological processes that may be used. If the state is unwilling to expand the capital and energy to establish a forward-looking regulatory framework, the state should ban the industrial process to be used.

I strongly support the ban proposed in HB 2359. Attached is a description of geothermal fracking, using a case study. It outlines opportunities and risks.

Geothermal Fracking, Hydro Shearing, and Hydraulic Fracturing

Enhanced Geothermal Systems (EGS)

- ❖ A conventional geothermal resource requires hot rock, permeability to allow flow, and water. Conventional geothermal resource sites are difficult to find.... there is one proven site in all of the State of Hawai'i
- ❖ Enhanced Geothermal Systems make geothermal possible at many more sites. Dozens may be possible in the State of Hawai'i
- ❖ According to 2007 MIT study for the National Research Council, EGS plants could produce 15 % of the US electrical power by 2050. To take advantage of this opportunity the study encourages the federal government to invest billions in research and risk mitigation financing for geothermal companies. DOE is executing that recommendation

EGS Technology

- ❖ Enhanced geothermal uses geothermal fracking (sometimes called hydraulic shearing or hydraulic fracturing) to break up the hot rock, or to spread pre-existing cracks, in order to increase its permeability.. After cold water cracks the hot rock, high-pressure water propagates the cracks to create a reservoir in the hot rock.
- ❖ Enhanced geothermal can provide water to the hot rock, if necessary, by bringing the water from the ocean or from nearby water wells. Thus instead of a site that combines permeability, water, and hot rock, EGS allows geothermal development at locations where only hot rock can be found.

Is Geothermal Fracking Really Fracking? A Lawyer's Point of View

What follows is a quote from Sandra Tvarian Stevens, a Washington D.C. lawyer:

In sum, due to the similarity of the basic fracking process utilized by both natural gas and geothermal companies, the likelihood for comparable claims and lawsuits being asserted against these industries is high, most notably with respect to claims arising out of earthquake damage and well blowouts. While both natural gas and geothermal companies alike face the potential for pollution claims, the kinds of allegations asserted may differ, at least in so far as geothermal companies reportedly rely more on saltwater injection and less on chemical additives in their fracking operations than natural gas companies. (Sandra Tvarian Stevens, August 31, 2011 | Coverage Insights)

A Case Study to Identify Issues with EGS

- ❖ Currently, a premiere EGS project is one at the Newberry Volcano National Monument (NVNM) near Bend, Oregon
- ❖ At this site EGS methods are being used to reinvigorate an existing geothermal resource so that it can make greater power.
- ❖ AltaRock (an EGS company that is exploring opportunities in the State of Hawai'i) will use geothermal fracking to increase the permeability of the resource
- ❖ What follows concerning challenges to geothermal fracking is based on the NVNM project's environmental assessment

What Are the Differences Between Oil/gas and Geothermal Fracking? (Based on the NVNM Project)

- ❖ Most advocates claim geothermal uses fewer and less toxic chemicals, but:
 - ❖ Oil and gas companies use chemicals that are proprietary
 - ❖ AltaRock uses chemicals that are proprietary
- ❖ Some have said that geothermal companies will use salt water rather than fresh water
 - ❖ AltaRock is using normal well water
- ❖ In geothermal fracking, cracking of rock is done by cold water against hot rock, but
 - ❖ Alta Rock uses water at an over pressure of ~ 2000 psi to propagate the cracks throughout the rock. The exact pressure is determined by in-well testing that finds what pressure is needed.

AltaRock's Effort in Oregon--Water Use (Based on the NVNM Project)

- ❖ AltaRock anticipates the fracking effort will use 24,000,000 million gallons of high pressure water over three weeks (24,000,000 gallons) (240 trips of the largest tanker trucks)(a home uses 400 gallons a day)
- ❖ AltaRock anticipates using 124,000,000 gallons of water to support the experimental project over two years (124,000,000 gallons) (1,240 tankers)

AltaRock's Effort in Oregon--Water Contamination (Based on the NVNM Project)

- ❖ Direction of cracks
 - ❖ A network of seismometers is supposed to determine which way and how far the hydraulically induced cracks propagate.
 - ❖ If the cracks propagate toward the fresh water layer risking contamination, it is assumed operations can be stopped with adequate buffer for safety.
- ❖ Blowouts
 - ❖ Wells to insert the fracking water are similar to injection wells at Puna Geothermal Venture (PGV), but overpressure will be higher than PGV's by ~1500 psi.

- ❖ PGV had a piping failure on an injection well in November 2012. The well pressure at the time of the PGV failure was considerably less than the pressure that will be used for fracking by AltaRock.

AltaRock's Efforts--History of Earthquakes

- ❖ An effort in Basel, Switzerland, was terminated when earthquakes caused \$9M damage. A NY Times investigative report questioned whether AltaRock was forthcoming with data.
- ❖ Germany stopped development on several geothermal plants over concerns with earthquakes
- ❖ A fracking effort at Geysers in California was terminated shortly after problems with Basel became public.
- ❖ Near Middleton, California, a committee mediation process has settled 19 damage claims from small earthquakes.

AltaRock's Effort in Oregon Earthquakes (Based on the NVNM Project)

- ❖ In Oregon, AltaRock will monitor cracks in a nearby dam to ensure they do not worsen as a result of induced earthquakes.
- ❖ In case improbable, but possible earthquakes. start to occur around the NVNM site, AltaRock plans to depressurize the geothermal reservoir by dumping water over a period of days. First the water would be dumped to empty storage tanks specified for that purpose and, if that were insufficient, then there is a contingency to dump the water to the ground

AltaRock's Efforts--Environment and Lifestyle Considerations

- ❖ Other issues that need to be considered include:
 - ❖ Truck and other traffic on narrow roads
 - ❖ Noise to neighbors
 - ❖ Environmental issues with clearing of land for plant development and for water transport
 - ❖ Local water shortages or degradation of water quality from "over-use"
 - ❖ Unabated or abated release of steam during flow testing (H₂S release)
 - ❖ Potential 930 foot steam and chemical plume during flow testing
 - ❖ Access to public trails and paths
 - ❖ Road building

AltaRock's Effort in Oregon--Community Involvement

- ❖ In Oregon the community involvement included:
 - ❖ Two meetings and two locations
 - ❖ A tour of the site
 - ❖ Newspaper articles

Hawai'i Regulation of Enhanced Geothermal Fracking

❖ In 2013 an attempt to ban hydraulic fracking, Senate Bill 375, did not make it from committee. Testimony against the bill included an influential lawyer speaking for a geothermal company.

Hawai'i Legislative Issues for Consideration

❖ Before allowing EGS projects the State might consider:

❖ How to protect the environment and water resources while providing access to a substantial supply of water to form an artificial reservoir. The need for a constant supply of additional water to make up for expected constant lost of water during geothermal production must also be considered.

❖ How to estimate risks of induced seismicity and to control and regulate those risks.

❖ How to place a major industrial activity inside a framework that gives the community voice and protects social, cultural, and economic interests

/S/ Thomas L Travis

Testimony In Support of HB2359
Relating to the Environment

Hearing 2/13/14; 8:40AM, House Conference Room 325

Thank you Representative Hanohano for introducing a bill to prevent hydraulic fracturing and the collection, storage, treatment, or discharge of wastewater from hydraulic fracturing in Hawaii. I ask the Chairs and Members of the House Committees on Energy & Environmental Protection/Water & Land, and Finance to support this forward thinking legislation.

While advances have been made in geothermal technology (<http://www.technologyreview.com/news/520361/fracking-for-geothermal-heat-instead-of-gas/>) we do not yet know the geologic impact underground explosions will have on our dike systems, adequately understand the affects of interactions between chemicals used in fracking and hydrothermal gases, or if and how lost water carrying chemicals would reach our ground water. (<http://hi.water.usgs.gov/studies/GWRP/hydrogeology.html>)

Scientists are now examining the relationship between asthma and the hydrogen sulfide gases released from volcanic lava (<http://www.environmentalhealthnews.org/ehs/news/science/2012/03/2012-0430-hydrogen-sulfide-asthma-med-use/>) and conducting research on the relationship between wastewater injection and earthquakes. (<http://www.npr.org/2013/07/11/200515289/wastewater-wells-geothermal-power-triggering-earthquakes>)

Since the technology is still in its early stages of development it would be wise to err on the side of caution and ban geothermal fracking in the state until it can be determined with a relative degree of professional and scientific certainty that it will not result in the contamination of our drinking water, the destabilization of our dike systems or health problems.

Please support HB2359 and vote YES to prohibit hydraulic fracturing in Hawaii.

Mahalo,
Pauline Mac Neil
Kailua, HI 96734

BIG ISLAND COMMUNITY COALITION



STEERING COMMITTEE

DAVE DeLUZ

JOHN E.K. DILL

ROCKNE FREITAS

MICHELLE GALIMBA

RICHARD HA

WALLACE ISHIBASHI

KU'ULEI KEALOHA COOPER

D. NOELANI KALIPI

KA'IU KIMURA

ROBERT LINDSEY

H.M. "MONTY" RICHARDS

KUMU LEHUA VEINCENT

BILL WALTER

LATE

Aloha Chair Lee and Chair Evan

The Big Island Community Coalition (BICC) <http://www.bigislandcommunitycoalition.com> is very much opposed to HB2359 -- the geothermal hydraulic fracturing bill. People in the BICC are acting in their individual capacity and not on behalf of their professional occupation.

The mission of the BICC is to drive the cost of Big Island electricity rates down. The Big Island electricity rates have been 25% higher than Oahu's for as long as anyone can remember. Rising electricity rates act like a giant regressive tax. Folks on the lowest rungs of the economic ladder and those who are on fixed income are especially vulnerable.

The Pahoia School complex in the Puna district where the East Rift Zone is located, at 89% participation, has the highest percent of students on the free/reduced lunch program in the ENTIRE state.

The geothermal working group, authorized by SCR 99 of which I was co-chair, cited The GeothermEx 2005 report which estimated geothermal generated electricity to be in the mid 8 cents per kilowatt hour range, while the cost of generating electricity from oil at today's oil price is estimated to be 21 cents per kilowatt hour and rising. Jim Kauahikaua chief scientist at the Hawaii Volcanic Observatory estimates that the Big Island will be over the hot spot for 500,000 to 1,000,000 years.

Many people are afraid of the term "fracking". They confuse what is happening in the oil and gas industry with geothermal drilling. They confuse enhanced geothermal systems (EGS) with our geothermal. The difference is that Hawaii geothermal has heat and water to transmit the heat, while other places have only hot rocks and need to pump water and fracture the rock to allow the heat to flow.

The (EGS) systems have had earthquakes. But, its generally in the 2 to 3 range on the Richter scale, not enough to raise kama'aina Big Islanders eyebrows. If we are concerned about size of earthquakes we should put in control procedures, not ban the procedure altogether. Oahu probably has the most to lose from ultra-restrictive procedures.

So, this geothermal "fracking" bill does nothing positive, it can however raise costs to the rubbah slippah folks. We are against this bill.

Richard Ha

Chairman
Big Island Community Coalition

LATE

HB2359

Submitted on: 2/13/2014

Testimony for EEP/WAL on Feb 13, 2014 08:40AM in Conference Room 325

Submitted By	Organization	Testifier Position	Present at Hearing
Rachele	Individual	Support	No

Comments:

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LATE



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February 13, 2014

COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION

Rep. Chris Lee, Chair
Rep. Cynthia Thielen, Vice Chair

COMMITTEE ON WATER & LAND

Rep. Cindy Evans, Chair
Rep. Nicole Lowen, Vice Chair

HB 2359
RELATING TO THE ENVIRONMENT

Committee Chairs and Members;

Hawaii's Thousand Friends, a statewide nonprofit organization dedicated to reasonable, responsible and appropriate land and water use, supports HB 2359 that prohibits hydraulic fracturing and the collection, storage, treatment or discharge of wastewater from hydraulic fracturing.

Hydraulic fracturing commonly known as "fracking" is used to extract energy resources from the earth. It is a violent process that pumps water, chemicals and sand into the ground to capture energy sources deep in the earth.

Without adequate enforceable safeguards fracking damages the environment, contaminates streams and the ocean and sends harmful discharges into the air polluting neighboring communities.

Currently fracking is used only on Hawai'i Island to extract geothermal energy but with geothermal areas identified on Oahu, Molokai and Maui it is prudent to be cautious and prohibit fracking to protect human health and the environment.

We urge you to pass HB 2359 out of committee.



Chevron Products Company
91-480 Malakole Street
Kapolei, HI 96707
Tel 808 682 2313
Fax 808 682 3116

Thursday, February 13, 2014 / 9:30 A.M.
Hawaii State Capitol, Room 325

House Bill 2156: Relating to Greenhouse Gas Emissions

Aloha Chair Lee and Vice Chair Thielen, and members of the House committee on Energy & Environmental Protection,

We are writing in support of HB 2156, Relating to Greenhouse Gas Emissions which would provide the director of the state Department of Health with greater flexibility in creating rules to reduce greenhouse gas emissions.

Chevron has worked with the Department of Health and other stakeholders concerning greenhouse gas emissions since the passage of Act 234 in 2007. We recognize that adopting rules for the state that achieve the goal of reducing emissions that are fair, reasonable, technically and economically feasible is a very time-consuming and complex task. Chevron supports HB 2156 as it provides the Department of Health additional flexibility and the time necessary to address the complex issues in a comprehensive manner.

Act 234 initially set 1990 as a benchmark goal for emissions reductions. Since 1990, the Chevron Hawaii refinery has systematically reduced its greenhouse gas emissions footprint, and has therefore not contributed to any increase in emissions that Act 234 seeks to reduce. Unfortunately, under the current draft rules without HB 2156, Chevron may nevertheless be required to further reduce its GHGs – something that is not technically or economically feasible for the refinery.

In summary, Chevron supports HB 2156 because it will give the Director the flexibility to confirm the GHG reductions achieved in the past by the Chevron Hawaii Refinery and possibly other sources, and focus the emissions reduction program on those stationary and other sources that are contributing to increased emissions since 1990.

