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**STATE OF HAWAII  
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DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS**

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**Testimony of the Department of Commerce and Consumer Affairs**

**Before the  
House Committee on Consumer Protection and Commerce  
Thursday, February 13, 2020  
2:00 p.m.  
State Capitol, Conference Room 329**

**On the following measure:  
H.B. 1851, H.D. 1, RELATING TO  
GRID-INTERACTIVE WATER HEATER SYSTEMS**

Chair Takumi and Members of the Committee:

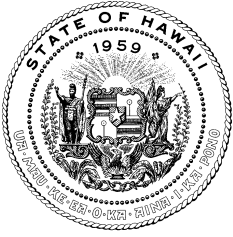
My name is Dean Nishina, and I am the Executive Director of the Department of Commerce and Consumer Affairs' (Department) Division of Consumer Advocacy. The Department appreciates the intent of and offers comments on this bill.

The purposes of this bill are: (1) to require grid-interactive water heater systems for new multi-unit dwelling construction, on or after January 1, 2022, unless a renewable energy technology system, as defined in Hawaii Revised Statutes (HRS) section 235-12.5, is substituted for use as the primary energy source for heating water; and (2) for the Public Utilities Commission (Commission) to establish standards for grid-interactive water heater systems that will include specifications for the performance, materials, components, durability, longevity, proper sizing, installation, and quality to promote the objectives of HRS section 269-124.

The Department supports the bill's intent to facilitate and increase the installation of grid-interactive water heater systems, which could provide grid services to electric utilities, provide customers with an increased opportunity to manage their energy use, and help Hawaii's transition to a clean energy industry. The Department also appreciates the apparent concern relating to possible interoperability issues by requiring the Commission to establish standards for grid-interactive water heater systems.

The Department notes that H.D. 1 places the provisions in HRS section 269, as opposed to section 196. Including subsection (b), which requires the Commission to adopt standards, in section 269 would be generally consistent with the existing language in HRS section 269-44, which requires the Commission to establish standards for solar water heater systems. Including subsections (c) through (e) would also be generally consistent with matters under the Commission's oversight. However, the Department respectfully suggests that including subsection (a) in section 269 may not be appropriate, since the Commission may not be able to enforce that requirement.

Thank you for the opportunity to testify on this bill.



# HAWAII STATE ENERGY OFFICE STATE OF HAWAII

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DAVID Y. IGE  
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SCOTT J. GLENN  
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## Testimony of **SCOTT J. GLENN, Chief Energy Officer**

before the  
**HOUSE COMMITTEE ON CONSUMER PROTECTION & COMMERCE**  
Thursday, February 13, 2020  
2:00 PM  
State Capitol, Conference Room 329

### In SUPPORT of **HB 1851, HD1** **RELATING TO GRID-INTERACTIVE WATER HEATER SYSTEMS.**

Chair Takumi, Vice Chair Ichiyama and Members of the Committee, the Hawaii State Energy Office (HSEO) supports HB 1851, HD1, which requires grid-interactive water heater systems for new multi-family dwellings on or after January 1, 2022, and respectfully offers the following comments:

To help ensure that the intent of the bill will not be circumvented, we recommend inserting in Chapter 269, subsection (e), "or heat pump water heater" between "electric resistance water heater" and "fitted with ...." According to the U.S. Department of Energy:

"Heat pump water heaters use electricity to move heat from one place to another instead of generating heat directly. Heat pump water heaters can be two to three times more energy efficient than conventional electric resistance water heaters."<sup>1</sup>

"Heat pumps work like a refrigerator in reverse. While a refrigerator pulls heat from inside a box and dumps it into the surrounding room, a heat pump water heater pulls heat from the surrounding air and dumps it -- at a higher temperature -- into a tank to heat water."<sup>2</sup>

This energy efficient water heating technology, along with the grid-interactive controls, paired with renewable energy, will help Hawaii achieve a resilient, clean energy, decarbonized economy.

Thank you for the opportunity to testify.

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<sup>1</sup> <https://www.energy.gov/energysaver/water-heating/heat-pump-water-heaters>

<sup>2</sup> <https://www.energy.gov/energysaver/water-heating/heat-pump-water-heaters>

TESTIMONY OF  
JAMES P. GRIFFIN, Ph.D.  
CHAIR, PUBLIC UTILITIES COMMISSION  
STATE OF HAWAII

TO THE  
HOUSE COMMITTEE ON  
CONSUMER PROTECTION & COMMERCE

February 13, 2020  
2:00 p.m.

Chair Takumi and Members of the Committee:

**MEASURE:** H.B. No. 1851 HD1

**TITLE:** RELATING TO GRID-INTERACTIVE WATER HEATER SYSTEMS.

**DESCRIPTION:** Commencing January 1, 2022, prohibits the issuance of building permits for new multi-unit dwellings that do not include grid-interactive water heater systems. Requires the PUC to establish standards for the systems. Effective 7/1/2050.

**POSITION:**

The Public Utilities Commission offers the following comments for consideration.

**COMMENTS:**

The Commission supports the intent of this measure. Grid-interactive water heaters can enable electric utility customers to provide valuable services back to the grid, which can reduce costs and assist utilities in advancing renewable energy and other policy goals.

The Commission appreciates the amendments made by the previous committee, which will better enable the Commission to establish standards for grid-interactive water heater systems. This includes placing the new section in Chapter 269, HRS, and providing the Commission with the flexibility needed to adopt effective standards.

The Commission also supports the language in this measure that ensures grid-interactive water heaters are eligible for participation in demand-side management programs offered by the Public Benefits Fee Administrator and Hawaiian Electric's demand response programs.

H.B. No. 1851 HD1  
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Thank you for the opportunity to testify on this measure.

**HB-1851-HD-1**

Submitted on: 2/11/2020 11:15:23 AM

Testimony for CPC on 2/13/2020 2:00:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Ted Bohlen	Climate Protectors Coalition	Support	No

Comments:

Chair Takumi, Vice Chair Ichiyama, and Consumer Protection and Commerce Committee members:

The Climate Protectors Coalition **strongly supports** HB1851 HD1!

We are a new group inspired by the Mauna Kea Protectors but focused on reversing the climate crisis. As a tropical island State, Hawaii will be among the first places harmed by the global climate crisis, with more intense storms, loss of protective coral reefs, and rising sea levels. We must do all we can to reduce our carbon footprint and become at least carbon neutral as soon as possible. One way to achieve this is by requiring new multi-family dwellings to include grid-interactive water heater systems under standards adopted by the PUC. Please pass this bill. Mahalo!



# Chamber of Commerce HAWAII

*The Voice of Business*

**Testimony to the House Committee on Consumer Protection and Commerce  
Thursday, February 13, 2020 at 2:00 P.M.  
Conference Room 329, State Capitol**

**RE: HB 1851 HD1, RELATING TO GRID-INTERACTIVE WATER HEATER SYSTEMS**

Chair Takumi, Vice Chair Ichiyama, and Members of the Committee:

The Chamber of Commerce Hawaii ("The Chamber") is **opposed to** HB 1851, which commencing on January 1, 2022, would prohibit the issuance of building permits for new multi-unit dwellings that do not include grid-interactive water heater systems. This bill would also require the PUC to establish standards for the system.

The Chamber is Hawaii's leading statewide business advocacy organization, representing 2,000+ businesses. Approximately 80% of our members are small businesses with less than 20 employees. As the "Voice of Business" in Hawaii, the organization works on behalf of members and the entire business community to improve the state's economic climate and to foster positive action on issues of common concern.

The Chamber has consistently been opposed to government mandates. This bill takes away consumers choice and does not identify the costs to comply with this new mandate, creating concerns of unintended consequences should this be implemented.

Rather than imposing mandates, we would prefer to see the Legislature provide consumers with incentives to move in a certain direction. When the Legislature mandated the installation of solar water heaters in all new single-family residential units, it removed the incentive for existing homeowners to convert to solar. With over 500,000 existing homes on Oahu, and only a few thousand new single-family residences permitted each year, incentivizing existing homeowners would have a much greater impact than mandating compliance on new home construction.

Thank you for this opportunity to share our concerns about HB 1851 HD1.



## HOUSE COMMITTEE ON CONSUMER PROTECTION & COMMERCE

February 13, 2020, 2:00 P.M.  
Room 329  
(Testimony is 2 pages long)

### TESTIMONY IN SUPPORT OF HB 1851 HD1

Aloha Chair Takumi, Vice Chair Ichiyama, and Committee members:

Blue Planet Foundation **supports HB 1851 HD1**, requiring that new multi-family buildings come equipped with smart, interactive water heaters—if a renewable energy source isn't being used to heat water. Grid-interactive water heaters (GIWH) are a critical tool to help us achieve our clean energy and climate goals by balancing energy use on the grid and helping to maximize the use of renewable energy. They also enable families who live in condos or high-rises to participate in and contribute to our clean energy future—and directly benefit from it.

A GIWH is a smart water heater that uses intelligent controls that are capable of interacting with and participating in utility load control or demand response programs. This allows the water heater to assist the utility in smoothing out electricity usage and increasing the use of variable renewable energy on the grid. This added intelligence converts the water heater into an asset for the power grid instead of a liability. A local company, Shifted Energy, has already deployed hundreds of GIWH systems across Oahu. An image of one of their water heater controllers is shown to the right.

**Grid-interactive water heaters can help to reduce the overall cost of energy in Hawaii.** By enabling the utility to tap into more low-cost renewable energy and by better balancing demand and supply, GIWHs will reduce electricity prices. When water heaters across the islands all turn on in the evening, it increases the load on the overall electricity system—at a time when the solar energy is dropping. This is the most expensive time for the utility to provide energy—the larger this “peak load”





is, the more electricity costs for everyone. Shifting this peak with smart technology like GIWHs will reduce the utility's burden to supply power for this expensive peak time.

Grid-interactive water heaters are an important tool to ensure that everyone can participate in Hawaii's clean energy evolution. Families who live in multi-family buildings such as condos and apartment complexes may not be able to directly access renewable energy options. Grid-interactive water heaters allow them to participate in energy storage and load shifting—critical services to support renewable energy on the grid. In providing these services through their smart GIWH, they may be able to benefit financially. Shifted Energy, the local company, is currently deploying GIWHs to over 2,500 residents across Oahu and Maui. Collectively, these GIWHs will provide 2.5 megawatts of energy storage capacity. **Participating residents will receive between \$180-\$300 over the next five years**, while they contribute to our collective clean energy future.

Given our urgent climate crisis, aggressive clean energy goals, and high cost of living, it doesn't make sense to install old-fashioned, disconnected, water heaters. **We urge the committee to advance HB 1851 HD1 to ensure that future buildings come equipped with modern, smart water heaters to help us achieve our climate goals and lower the cost of living in Hawaii.**

Thank you for the opportunity to testify.



**HOUSE COMMITTEE ON CONSUMER PROTECTION AND COMMERCE  
State Capitol, Conference Room 329  
415 South Beretania Street  
2:00 PM**

**February 13, 2020**

RE: HOUSE BILL NO. 1851 H.D. 1, RELATING TO GRID-INTERACTIVE WATER HEATER SYSTEMS

Chair Takumi, Vice Chair Ichiyama, and members of the committee:

My name is Dwight Mitsunaga, 2020 President of the Building Industry Association of Hawaii (BIA-Hawaii). Chartered in 1955, the Building Industry Association of Hawaii is a professional trade organization affiliated with the National Association of Home Builders, representing the building industry and its associates. BIA-Hawaii takes a leadership role in unifying and promoting the interests of the industry to enhance the quality of life for the people of Hawaii. Our members build the communities we all call home.

**BIA-Hawaii is opposed to H.B. 1851 H.D. 1**, which would prohibit the issuance of building permits for new multi-unit dwellings that do not include grid-interactive water heater systems. The bill also would require the PUC to establish standards for the system.

BIA-Hawaii has consistently opposed any type of government mandate which takes away consumers choice and does not identify the cost to comply. In addition, the bill is silent on the cost to install the system, as well as the amount of the expected pay-back for typical multi-family dwelling in Hawaii. With housing affordability remaining a major problem in Hawaii, the legislature should focus on keeping these types of legislation "revenue neutral" by providing rebates or tax credits for multi-family developers who install these types of systems. There are over 500,000 existing homes on Oahu, and only a few thousand new single-family residence permitted each year. Incentivizing existing homeowners will have a far greater impact than mandating compliance on new home construction.

We are opposed to H.B. 1851 H.D. 1 and appreciate the opportunity to express our views on this matter.

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HOUSE COMMITTEE ON CONSUMER PROTECTION & COMMERCE

**February 13, 2020**

**Shifted Energy Strongly Supports HB 1851, Relating to Grid-Interactive Water Heater Systems**

Aloha Chair Takumi, Vice Chair Ichiyama, and members of the Committee:

Thank you for the opportunity to submit testimony in strong support of HB 1851. Including grid-interactive water heater requirements in statute will provide Hawai'i with another important tool to enable us to meet our 100% renewable energy goals while ensuring that all residents can benefit from that transition.

Shifted Energy was founded in Hawai'i in 2014 from the energy efficiency and energy justice activities of non-profit Kanu Hawai'i. During our community engagement and outreach activities, we identified two key lessons that caused us to realize the value of water heaters as distributed energy resources:

- 1) Low-and-moderate income families, multi-family dwelling residents, and renters are often not able to take advantage of emerging technologies, such as rooftop solar and home battery systems, that would reduce their electric bills and allow them to support renewable energy deployment; and
- 2) Electric water heating is the predominant form of water heating and makes up a disproportionately large percentage of many Hawai'i residents' electric bills.

Shifted Energy was thus founded with the goals of engaging hard-to-reach communities in the renewable energy transformation through utilization of their electric water heaters. We currently employ 8 people on Oahu, have just hired a new engineering graduate who we connected with through HTDC, and look forward to continue building our company in Hawai'i in support of local clean energy innovation and job creation.

To understand the concept and benefit of 'grid-interactive water heating', it is important to realize that Hawaii's 100% renewable energy goal requires Hawaiian Electric to cost-effectively and reliably integrate increasing amounts of *intermittent* renewable energy. The intermittent nature of renewable energy generation means that 1) electricity production is not always aligned with customer demand, and 2) there are often rapid fluctuations in generation as clouds pass overhead. So as Hawaiian Electric adds more renewable generation to Oahu's electricity system, they must also:

- 1) Add ways to store solar energy for delivery later in the day;
- 2) 'Smooth' the rapid fluctuations to maintain the stability of the power grid; and
- 3) Reduce total electricity demand during periods when renewable generation is not high (e.g., during the night) through energy efficiency or demand *shifting*.

Grid-scale and customer-sited energy storage, almost universally lithium-ion batteries, are one technology that can provide all of the above services. Hawaiian Electric is actively procuring large energy storage and solar projects, and homeowners with batteries are aggregating their systems to provide the utility with "virtual power plants". Unfortunately, siting constraints and high costs make such batteries mostly unavailable to condo and apartment residents, so they cannot participate in the economic benefits of providing grid services to Hawaiian Electric.

Enter Grid-Interactive Water Heating.

Water heater tanks are essentially large cylinders that store *thermal* energy, and there are hundreds of thousands of them across Oahu. Shifted Energy has developed an inexpensive, non-intrusive, rapidly-installable controller, similar to a smart thermostat, that can be attached to any electric water heater to convert it into a thermal battery. When deployed for apartment or condominium renters and owners, Shifted's controllers essentially transform the entire building into a giant battery simply by upgrading existing electric water heater assets. These batteries can then be enrolled into Hawaiian Electric demand response and grid service programs, and Shifted Energy's software ensures they provide grid reliability and enhance renewable integration. Hawaiian Electric then financially compensates renters and owners for the grid services that their water heaters provided. All the while, Shifted's intelligent software ensures that families always have hot water when they need it.

Because so many families already have electric water heaters and the cost of the controller is low, requiring grid-interactive water heating across Hawai'i ensures that everyone, including underserved and hard-to-reach families, can finally participate in and benefit from the clean energy revolution. In fact, Shifted Energy is currently deploying 2.5 Megawatts of grid-interactive water heater capacity across Oahu and Maui, engaging more than 2,500 residents in Hawaiian Electric's Grid Services Purchase Agreement program. Participating residents will receive between \$180-\$300 over the next 5 years, but, more importantly, they will be engaged, active participants in Hawaii's renewable energy future.

For the foregoing reasons, Shifted Energy **strongly supports** this measure, and we look forward to working with the Legislature to increase opportunities for rapidly scalable, cost-effective clean energy technologies like grid-interactive water heating.

Mahalo,

Randy Fish  
Director, Business Development and Policy  
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