



**LATE**

STATE OF HAWAII  
DEPARTMENT OF EDUCATION  
P.O. BOX 2360  
HONOLULU, HAWAII 96804

**LATE**

**Date:** 01/30/2020

**Time:** 08:30 AM

**Location:** 325

**Committee:** House Energy & Environmental  
Protection

**Department:** Education

**Person Testifying:** Dr. Christina M. Kishimoto, Superintendent of Education

**Title of Bill:** HB 1846 RELATING TO ENERGY EFFICIENCY.

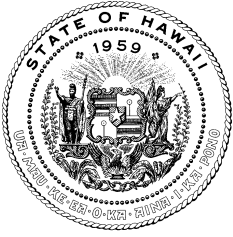
**Purpose of Bill:** Requires an energy audit for all state facilities by July 1, 2021, and begin to address the audit results by January 1, 2022. Requires a report of the results of the audit to the legislature. Beginning July 1, 2020, requires the design of new state building construction to allow for the building to be a net zero capable structure, use post-industrial carbon dioxide mineralized concrete where cost-effective, have 25% of its accompanying parking lot be electric vehicle charger ready, and account for projected costs of utility bills when making decisions about the most cost-effective building design. Requires public buildings to be benchmarked beginning on July 1, 2021, and requires benchmarking data to be maintained by the Hawaii state energy office in a publicly available format. Requires equipment and systems to be assessed for energy efficiency every five years.

**Department's Position:**

The Department of Education (Department) supports HB 1846 for new building construction.

The Department has 4,425 buildings, which equate to approximately 20.7 million square feet of older structures. On average, these buildings are nearly 50 years old. Energy audits would take nine months to complete at the cost of approximately \$600,000. The costs of the energy audits as well as designs for net zero capable structures require significant funding that is only available for new construction.

The Hawai'i State Department of Education is committed to delivering on our promises to students, providing an equitable, excellent, and innovative learning environment in every school to engage and elevate our communities. This is achieved through targeted work around three impact strategies: school design, student voice, and teacher collaboration. Detailed information is available at [www.hawaiipublicschools.org](http://www.hawaiipublicschools.org).



# HAWAII STATE ENERGY OFFICE STATE OF HAWAII

235 South Beretania Street, 5<sup>TH</sup> Floor, Honolulu, HI 96813 | energy.hawaii.gov

DAVID Y. IGE  
GOVERNOR

SCOTT J. GLENN  
CHIEF ENERGY OFFICER

(808) 587-3807

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

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

Thursday, January 29, 2020  
8:30 AM  
State Capitol, Conference Room 325

In SUPPORT of  
**HB 1846**  
**RELATING TO ENERGY EFFICIENCY.**

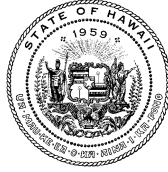
Chair Lowen, Vice Chair Wildberger and members of the Committee. The Hawaii State Energy Office (HSEO) supports HB 1846 that requires an energy audit for all state facilities to be benchmarked using ENERGY STAR Portfolio Manager, by July 1, 2021 with the HSEO to maintain the benchmarking data and have the data in a publicly available format. Our office also defers to the Department of Accounting and General Services (DAGS) and other state agencies, as the benchmarking process takes time and resources.

Benchmarking is useful for property owners and facility operators, managers, and designers. It facilitates energy accounting, comparing a facility's energy use to similar facilities to assess opportunities for improvement, and quantifying/verifying energy savings.  
<https://www.energy.gov/eere/slsc/building-energy-use-benchmarking>.

Regarding the design of new state buildings to be net-zero capable; requiring post-industrial carbon dioxide mineralized concrete; if concrete is specified; and where it is cost-effective; and having 25% of the parking to be electric vehicle charger ready; HSEO is supportive of these measures and believes that this is all in alignment with the State's clean energy and decarbonization goals. HSEO defers to DAGS on the potential of any particular building to be net-zero; in general, HSEO believes public facilities have an important role in contributing not only to energy efficiency but energy generation as well.

Thank you for the opportunity to testify.

DAVID Y. IGE  
GOVERNOR



CURT T. OTAGURO  
COMPTROLLER  
AUDREY HIDANO  
DEPUTY COMPTROLLER

**STATE OF HAWAII**  
**DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES**  
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

WRITTEN TESTIMONY  
OF  
CURT T. OTAGURO, COMPTROLLER  
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES  
TO THE HOUSE COMMITTEE ON  
ENERGY & ENVIRONMENTAL PROTECTION

THURSDAY, JANUARY 30, 2020, 8:30 A.M.  
CONFERENCE ROOM 325, STATE CAPITOL

H.B. 1846

RELATING TO ENERGY EFFICIENCY.

Chair Lowen, Vice Chair Wildberger, and members of the Committee, thank you for the opportunity to submit testimony on HB 1846.

The Department of Accounting and General Services (DAGS) supports the intent of the bill to increase the energy efficiency of State buildings and offers the following comments for the committee's consideration.

The requirement for all State facilities to implement efficiency measures or enter into performance contracts by January 1, 2022 may overburden the industry and diminish the quality of the work performed.

The definition of Net Zero Capable does not specify that the energy generation is required to be renewable.

The requirement of all new State building construction to allow for net zero capability may not be possible for most buildings. To meet this requirement, new State buildings will require a large amount of area for energy generation.

Funding will be required to meet the requirements of this Bill. Performing the benchmarking, implementing efficiency measures and allowing new buildings to be net zero capable will all require additional funding.

Thank you for the opportunity to submit testimony on this matter.



Before the House Committee on Energy and Environmental Protection  
Thursday, January 30, 8:30 AM, Conference Room 325  
HB 1846: Relating to Energy Efficiency

Chair Lowen, Vice Chair Wildberger, and members of the committee:

The Hawai'i Energy program supports HB 1846 and offers the following comments.

Hawai'i Energy works to empower island families and businesses on behalf of the Hawai'i Public Utilities Commission (PUC) to make smart energy choices to reduce energy consumption, save money, and pursue a 100% clean energy future. Energy efficiency is cheapest option to help us achieve our 100% clean energy goal by eliminating waste and being more efficient.

Hawai'i Energy applauds the emphasis on improving energy efficiency in State facilities. The State of Hawai'i has had a successful Energy Savings Performance Contract (ESPC) program that drove a significant level of energy savings projects in 2009 – 2015. The State has benefitted substantially from ESPC's. Hawai'i Energy estimates that since 1996, Hawai'i government agencies have saved, on average, more than 5 million kilowatt hours a year, equating to over \$24 million in savings, with the majority of this coming through ESPC's.

ESPC procurements have significantly dropped since 2015, due to a number of potential factors including previously completed projects, the approved ESCO list not being renewed for a period, the use of standard procurement mechanisms rather than ESPC, and state agencies not having the expertise and resources to develop, procure, and manage construction. With advances in technologies that increase efficiency, coupled with the number of buildings that still are largely inefficient, opportunity remains and Hawai'i Energy wishes to encourage deeper energy efficiency in State facilities.

Attacking energy use at all State facilities will take time, manpower, and in some instances funding. Hawai'i Energy recommends some modifications to the current bill:

### **1. Prioritize larger facilities**

Given the amount of State facilities, the best use of time and resources is to focus on the most energy intensive facilities, which generally correlates to the size of the building. The City of San Francisco adopted the following guidelines that also would work well for Hawai'i:

- Facilities under 10,000 sq ft are exempt
- Facilities between 10,000 and 49,999 sq ft require an ASHRAE Level 1 Audit
- Facilities 50,000 square feet require a an ASHRAE Level 2 Audit

### **2. Allow/encourage the use of the ESPC process to complete the audits and benchmarking**

Energy audits could cost State agencies a lot of money to conduct. The State of Hawai'i's ESPC process is well designed process that could offer a no-cost option for State agencies to complete the required energy audits. As part of the ESPC process, when an ESCO is selected, they are required to perform an Investment Grade Audit to finalize pricing and savings for the state agency to develop the scope and cost of the project. State agencies could require the Level 1 or Level 2

audit as part of the IGA process to eliminate the cost of the audit to the agency as long as the agency moves forward with the project. This also ensures a pathway to implementation as the ESPC process will allow for the project to be financed and paid for out of the savings. Additionally the ESPC process allows for the use of design-build instead of requiring the State agencies to then also pay a consultant to develop the bid and product specifications.

**3. Encourage a holistic approach**

A well-done energy audit will identify all energy efficiency opportunities. However not all measures may be cost effective. For example, window replacements can be very expensive with minimal savings, making it a poor investment.

Since the goal is to maximize energy savings, while also reducing maintenance costs, Hawai'i Energy suggests buildings be evaluated holistically and that the measures be bundled to create a portfolio. Wording in the bill could designate that all measures combined with simply payback threshold or life-cycle cost threshold be implemented. Hawai'i Energy is happy to work with interested stakeholders to establish the proper threshold.

**4. Ensure all equipment meets or exceeds requirements by Hawai'i Energy to qualify for incentives**

Hawai'i Energy's incentives are designed to encourage the use of energy efficient equipment. While we encourage residents, businesses, and government facilities to go above our minimum qualifying levels (which often have higher incentives), Hawai'i Energy strongly recommends that the minimum requirement be our qualifications for incentives, where applicable.

Thank you for the opportunity to provide comments on and our **support** of HB1846.

Brian Kealoha  
Executive Director  
Hawai'i Energy



Josh Frost - President • Patrick Shea - Treasurer • Kristin Hamada  
Nelson Ho • Summer Starr

Wednesday, January 29, 2020

Relating to Energy Efficiency  
Testifying in Support

Aloha Chair and members of the committee,

The Pono Hawai'i Initiative (PHI) **supports HB1846 Relating to Energy Efficiency**, which requires energy audits for all state facilities and a report to the legislature on the findings and sets standards for all new state building construction to be energy efficient and building to a net-zero capable structure.

As Hawai'i moves toward a greener future the first to make positives changes should be our own state government and infrastructure. By requiring all new state buildings to meet net zero standards, the State helps to lead the rest of the community to meet those goals. For those structures already built knowing how where the problems and inefficiencies are is the first step in fixing and improving. It is so important that the State show that these changes and steps can be taken and need to be taken in order to reach the goal of 100% renewable energy by 2045.

For all these reasons, we urge you to move this bill forward.

Mahalo for the opportunity,  
Gary Hooser  
Executive Director  
Pono Hawai'i Initiative

**HB-1846**

Submitted on: 1/29/2020 7:15:51 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

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

Comments:

The Climate Protectors Coalition **strongly supports** HB1846!

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, including by making State facilities more energy efficient by requiring energy audits. Mahalo!





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

HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION  
Thursday, January 29, 2020 — 8:30 a.m. — Room 325

## **Ulupono Initiative Supports HB 1846, Relating to Energy Efficiency**

Dear Chair Lowen and Members of the Committee:

My name is Amy Hennessey, and I am the Senior Vice President of Communications & External Affairs at Ulupono Initiative. We are a Hawai'i-based impact investment firm that strives to improve our community's quality of life by creating more locally produced food; increasing affordable clean renewable energy and transportation options; and better managing waste and fresh water resources.

**Ulupono supports HB 1846**, which requires all state facilities to undergo energy audits to implement efficiency measures and reassess every five years thereafter, requires all state buildings to track energy use and performance over time, and require that all new state building construction shall allow for state buildings to be net-zero capable, use of carbon-mineralized concrete where cost-effective, and require that 25% of parking stalls are electric vehicle charger ready.

Ulupono supports energy efficiency measures to lower consumption across the State. As Hawai'i's energy issues become increasingly complex and challenging, we appreciate this committee's efforts to look at policies that reduce the State's overall energy demand, which in return should save the State, and taxpayers, money. Meeting the State's 100% renewable goal by 2045 will require everyone's commitment and it is important for the State government to lead the way.

Furthermore, electric vehicles (EVs) are an important avenue to address Hawai'i's pressing climate issues and align with the State's energy and environmental goals. EVs currently offer an effective option to progress clean renewable ground transportation and provide immediate benefits to Hawai'i.

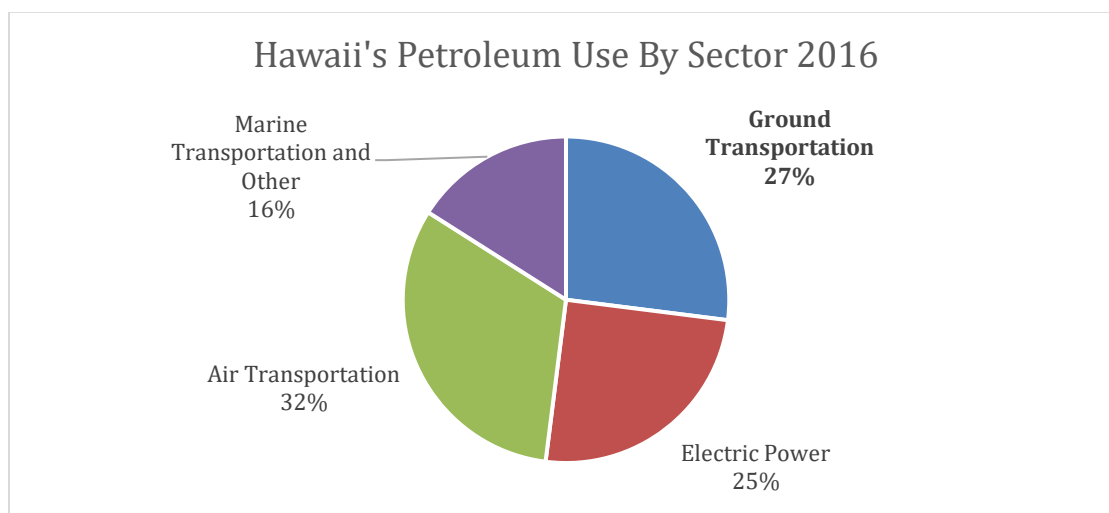
In fact, the International Code Council (ICC), recently voted to include EV-ready measures in the International Building Code. The City and County of Honolulu is also in final consideration of a measure to require EV-ready in new commercial construction. The State of Hawai'i should continue to lead by example and further show the world that Hawai'i is serious about the sustainability and resiliency of our community by encouraging EVs and

*Investing in a Sustainable Hawai'i*

EV infrastructure as this bill proposes.

### **EVs Provide Immediate Energy and Environmental Impact**

Ground transportation alone utilizes more than a quarter of the state’s imported petroleum. Electrifying ground transportation will reduce our demand for imported fossil fuels, keeping millions of dollars in the state and cutting harmful pollution.



*Source: Hawaii State Energy Office – Hawaii Energy Facts & Figures*

Converting from petroleum-based vehicles to EVs immediately reduces GHG emissions, helping combat climate change and its impacts on our islands. EVs produce zero-emissions at the tailpipe, and even when full lifecycle emissions (from manufacturing through disposal) are considered, EV emissions are approximately 50 percent lower than internal combustion engine (ICE) vehicles.

EVs can also support the integration of more renewables on the electric grid with smart charging technology and rate structures. Thus, proliferating EVs throughout Hawai‘i can help accelerate progress towards the State’s 100 percent RPS goal, as well as contribute to the State’s Paris Agreement commitments and carbon neutral goal.

### **Hawai‘i Should Be Doing More**

EVs are the future, but they currently only represent less than one percent of all passenger vehicles in the state. Hawai‘i must encourage this still nascent market and be prepared with the necessary infrastructure.

Public EV charging stations are a vital component of the EV system. They provide access to charging for drivers who may not be able to charge at home, such as residents who live in multi-unit dwellings, and alleviate range anxiety for all EV drivers, a top-cited barrier to purchasing EVs. Similar to the benefits that community solar offers to renters and

apartment residents, public chargers open up the opportunity and feasibility of owning an EV to more people, increasing equity and access.

Requiring qualifying facilities to be “EV ready” is smart and essential future proofing. Installing EV infrastructure post-construction costs three times more than at the time of new construction, and it represents approximately less than one percent of total new construction project cost. Given that building construction has a ~30-year life, this bill is a fiscally prudent way for the State to prepare for 2049 and beyond, when EVs are expected to be abundant and charging will be critical.

Other states and cities recognize the importance of EV infrastructure and already have policies that require public and private parking facilities to be built to support EV charging. Below are examples of leading state and city EV-ready requirements:

- California – 8 percent of parking stalls at nonresidential properties
- Vancouver – 100 percent of parking stalls at multi-unit residential and 10 percent of stalls at commercial properties
- New York City – 20 percent of parking stalls at parking facilities (open lots and garages)
- Atlanta – 20 percent of parking stalls at new commercial and multifamily properties
- San Francisco – 20 percent of new residential, commercial and municipal properties

This bill is an important measure for the State to lead the private market here in Hawai‘i, while continuing to show the world that Hawai‘i is a clean energy leader

Thank you for this opportunity to testify.

Respectfully,

Amy Hennessey, APR  
Senior Vice President, Communications & External Affairs



ELEMENTAL  
EXCELERATOR

**Written Statement of Elemental Excelerator  
before the House Committee on Energy and Environmental Protection**

**In consideration of [HB 1846](#)  
RELATING TO ENERGY EFFICIENCY  
January 30, 2020**

**Aloha Chair Lowen, Vice Chair Wildberger, and Members of the House Committee on Energy and Environmental Protection:**

Elemental Excelerator respectfully **submits strong support** for HB 1846, which:

1. Requires an energy audit for all state facilities by July 1, 2021, and begin to address the audit results by January 1, 2022. Requires a report of the results of the audit to the legislature.
2. Beginning July 1, 2020, requires the design of new state building construction to allow for the building to be a net zero capable structure, use post-industrial carbon dioxide mineralized concrete where cost-effective, have 25% of its accompanying parking lot be electric vehicle charger ready, and account for projected costs of utility bills when making decisions about the most cost-effective building design.
3. Requires public buildings to be benchmarked beginning on July 1, 2021, and requires benchmarking data to be maintained by the Hawaii state energy office in a publicly available format. Requires equipment and systems to be assessed for energy efficiency every five years.

Elemental Excelerator is a Honolulu-based non-profit organization that supports climate positive startup companies that are helping solve Hawai'i's most urgent environmental problems. Each year, we select 15-20 companies annually that best fit our mission and fund each company up to \$1 million. To date, we have awarded \$36 million to 99 companies resulting in over fifty demonstration projects in Hawai'i & the Asia Pacific.

About twenty percent of Elemental Excelerator's portfolio companies focus on resilience in the real estate sector. We support the key points listed above, and aim to provide some additional information about the requirement "to allow for the building to be a net zero capable structure, use post-industrial carbon dioxide mineralized concrete where cost-effective".

This provision aligns with the Hawaii Department of Transportation (HDOT) deployment in May 2019 of post-industrial carbon dioxide mineralized concrete as a sustainable transportation initiative.<sup>1</sup> The initial test involved a pour of 150 cubic yards of carbon-injected concrete next to an equivalent pour of standard concrete mix on an access road for the Kapolei Interchange Phase 2 on Oahu Island. The carbon-injected material has turned out to be stronger and more workable, with no increase in cost over traditional concrete.<sup>2</sup> It also aligns with Honolulu City Council Resolution 18-283, which was unanimously adopted in April 2019. The resolution *"requests the city administration to consider using carbon dioxide mineralization concrete for all future infrastructure projects utilizing concrete"*<sup>3</sup> In July 2019, the United States Conference of

Mayors adopted the "Honolulu Resolution," urging 400 cities to introduce legislation that prioritizes utilizing post-industrial carbon dioxide mineralized concrete for use in city-building and infrastructure projects to their city councils.<sup>4</sup> It also aligns with existing policies like Act 15 and Act 32, which structures the Greenhouse Gas Sequestration Task Force<sup>5</sup> and sets a target for a zero-emissions clean economy by 2045.<sup>6</sup>

These policies demonstrate a growing commitment in Hawai'i and across the nation to repurpose and sequester CO<sub>2</sub>, known as CO<sub>2</sub> utilization or CO<sub>2</sub>U, and signal Hawai'i's leadership in growing its economy while prioritizing sustainable new technologies.

**We strongly support HB 1846 and the requirement for new state building construction to use post-industrial carbon dioxide mineralized concrete for the following reasons:**

1. **It can be implemented quickly and is economically responsible:** The 2016 *Global Roadmap for Implementing CO<sub>2</sub> Utilization* (GCI) study has identified several companies in the market that use post-industrial carbon dioxide [CO<sub>2</sub>] mineralized concrete in partnership with existing concrete producers. This process can reduce operational costs and create up to \$26 billion in new production efficiencies.<sup>7</sup>
2. **It reduces greenhouse gas emissions:** Concrete is the most widely used construction material in the world because of its low cost, strength, and durability. However, 7% of CO<sub>2</sub> emissions come from cement production. In 2017, Hawai'i imported around 300,000 tons of cement from Taiwan. The importing of concrete leads to additional costs in shipping, which also leads to a larger CO<sub>2</sub> footprint. With CO<sub>2</sub> mineralization, concrete development can reduce up to 700 megatons of annual global CO<sub>2</sub> emissions.<sup>8</sup>
3. **It is a competitive and innovative technology:** The GCI study found that the emerging carbon utilization industry is expected to become a \$1 trillion industry by the year 2030.<sup>9</sup>

Mahalo for the opportunity to provide testimony.

Sincerely,



Aki Marceau  
Managing Director- Policy & Community

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<sup>1</sup> [HDOT Tests Sustainable Concrete Mix Designed to Reduce Carbon Footprint of Road Construction](#), May 2019

<sup>2</sup> [Hawaii's DOT tests sustainable concrete](#), May 2019

<sup>3</sup> Honolulu City Council Resolution 18-283

<sup>4</sup> 2019 United States Conference of Mayors, [Honolulu Resolution](#)

<sup>5</sup> Hawai'i [Act 015 GM 1115](#)

<sup>6</sup> Hawai'i [Act 32 GM 1132](#)

<sup>7</sup> CarbonCure. (n.d.). Retrieved from <https://www.carboncure.com/>

<sup>8</sup> Who's who in North American cement imports (October 2018). Retrieved from <https://cementdistribution.com/wp-content/uploads/2018/11/Who-is-who-in-North-American-cement-imports.pdf>

<sup>9</sup> Global Roadmap for Implementing CO<sub>2</sub> Utilization (November 2016), p.5. Retrieved from <http://www.globalco2initiative.org/wp-content/uploads/2018/09/GlobalRoadmapCO2.pdf>



**HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION**

January 30, 2020, 8:30 A.M.

Room 325

(Testimony is 3 pages long)

**LATE**

**TESTIMONY IN SUPPORT OF HB 1846**

Aloha Chair Lowen, Vice Chair Wildberger, and members of the Committee:

Blue Planet Foundation **supports HB 1846**, which **requires state agencies to lead by example** when it comes to energy efficiency and benchmarking in facilities, data access, as well as ensuring new state building construction is “future proof” by being net-zero capable and electric vehicle (EV)-ready.

**HB 1846 HELPS STATE FACILITIES LEAD ON EFFICIENCY**

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House Bill 1846 can help state agencies achieve deeper energy efficiency savings, and in return lower costs for taxpayers that ultimately pay the state’s energy bills. Energy audits and benchmarking can help identify where the most savings can be achieved. Because energy audits can be costly, the state’s energy savings performance contract program will be essential to successful implementation of HB 1846. Performance contracting—which requires an energy audit at the outset of the process—offers a no-cost option for state agencies to complete the energy audits contemplated in the bill. This also ensures a pathway to implementation because the energy performance contract process would allow the project to be financed and repaid through the energy savings.

**HAWAI’I NEEDS EV-READY BUILDINGS**

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Blue Planet strongly supports the provisions in HB 1846 that require at least 25% of a new state building's accompanying parking lot to be electric vehicle charger ready. This bill will decrease the cost of EV charging infrastructure retrofits for state agencies in the future by ensuring that all conduit and power capacity is installed upon initial construction and will increase the likelihood that state employees would be able to charge their EVs at work. This is an important first step to lowering the overall cost of our transition to electrified transportation and make electric vehicles more accessible to O’ahu residents.

While Hawai’i has been making strides on renewable electricity, we are falling short on decarbonizing our ground transportation sector. Greenhouse gas emissions from transportation

are increasing. Last year, we sold 6% more gasoline than the previous year.<sup>1</sup> Over one million gasoline-powered vehicles are on Hawai'i's roads—and from them comes nearly five million metric tons of climate-changing carbon pollution. Although we now have roughly 10,000 EVs on Hawai'i's roads, they still only make up less than 1% of all registered vehicles in the state.<sup>2</sup>

Electric vehicles will play an integral role in Hawai'i's clean energy future. While EVs that use the existing electricity grid to charge still use mostly fossil fuel, they use that fuel more effectively than burning fuel directly in a typical gasoline engine. This is why EVs are much less expensive to “fuel” per mile than their gasoline counterparts. Further, by using stored electrical energy, EVs can take advantage of intermittent solar, wind, and other clean energy resources. Most vehicles sit idle over 22 hours of the day, so they can become de facto energy storage devices if their batteries are plugged into the grid when they are not in use. With smart grid infrastructure in place, EVs become an essential component to electricity load and clean energy resource balancing—in addition to providing clean mobility solutions for Hawaii residents.

House Bill 1846 can help to overcome a key barrier to EV adoption: the lack of adequate EV charging infrastructure. The International Energy Agency has found that “the availability of chargers emerged as one of the key factors for contributing to the market penetration of EVs.”<sup>3</sup> Unlike gasoline car owners, charging behavior for EV owners indicates that over 80% of EV drivers in the United States charge their cars at home.<sup>4</sup> Many Hawai'i residents, however, live in apartments and multi-unit residential buildings,<sup>5</sup> and the vast majority of parking facilities at these residential properties currently lack EV chargers. Moreover, the optimal time to charge an EV is during the day when renewable energy is abundant. Yet, there is a notable lack of charging options at workplaces and at publicly accessible locations.

By ensuring that we are “future-proofing” new state construction projects, this measure is an important step toward increasing EV charging options for those who don't have access to charging at home or at work.

The most challenging aspect of EV charger installation is the common lack of electrical capacity and distributed subpanels to support broad deployment of charging infrastructure. Studies have shown that **installing EV infrastructure at the time of construction can be 91% less expensive than post-construction retrofits**, and per stall installation costs can be reduced through economies of scale.<sup>6</sup>

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<sup>1</sup> *DBEDT Monthly Energy Trends*, December 2019, <http://dbedt.hawaii.gov/economic/energy-trends-2/>.

<sup>2</sup> *Id.*

<sup>3</sup> *Global EV Outlook 2017*, at 29, <https://www.iea.org/reports/global-ev-outlook-2017>.

<sup>4</sup> *Department of Energy*, <https://www.energy.gov/eere/electricvehicles/charging-home>.

<sup>5</sup> The 2017 American Community Survey estimated that more than one third of housing units in Hawai'i are apartments. See *2017 American Community Survey*, searchable at <https://data.census.gov/>.

<sup>6</sup> See <http://evchargingpros.com/wp-content/uploads/2017/04/City-of-SF-PEV-Infrastructure-Cost-Effectiveness-Report-2016.pdf>.

While this bill would not require the installation of the actual EV charging infrastructure, it would require that the power capacity and conduit be set up during construction at new state buildings, which would dramatically reduce retrofit costs at the time of charger installation, creating cost savings downstream.

Cities around North America are adopting EV-ready requirements for commercial and residential new construction. Seattle, San Jose, Atlanta, San Francisco, Denver, and Oakland have adopted requirements for a certain percentage of stalls to be ready for Level 2 charging. Vancouver, British Columbia, now requires that 100% of new parking stalls be built ready for EV chargers. If the state truly wishes to lead by example, Blue Planet Foundation supports **expanding the EV-ready requirement from 25% of new stalls to 100% of new parking stalls.**

Thank you for the opportunity to testify.



**HB-1846**

Submitted on: 1/29/2020 7:51:39 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
David Mulinix	Our Revolution Hawaii	Support	No

Comments:

**LATE**

## Written Statement about CarbonCure Technologies for the Hawai'i State House of Representatives Committee on Energy and Environmental Protection

Thursday, January 30<sup>th</sup>, 2020

In Consideration of Resolution HB 1846  
RELATING TO ENERGY EFFICIENCY

Dear Chair Lowen and members of the Energy and Environmental Protection Committee,

CarbonCure Technologies respectfully submits this statement in strong support of HB 1846 which requires a series of actions to be taken to increase the energy efficiency of state facilities and buildings, consider energy costs and requirements in design, and to reduce the embodied carbon footprint of public buildings through the use of carbon dioxide (CO<sub>2</sub>) mineralized concrete.

CarbonCure is a clean technology company that has had the honor to be a recent cohort company of the Elemental Excelerator program based in Honolulu. Our investors include Breakthrough Energy Ventures, a \$1 billion clean energy venture fund comprising 20 global business leaders. We are the world leader in CO<sub>2</sub> mineralization technologies and were recently named the North American Cleantech Company of the Year by Cleantech Group<sup>1</sup>.

Beginning in 2019 with our concrete producer partners Island Ready-Mix and Hawai'i Concrete and Cement Company, we have produced post-industrial CO<sub>2</sub> mineralized concrete that meets performance criteria. This form of concrete is readily available to support future state facility construction projects at a competitive cost. For example, the Hawai'i Department of Transportation (HDOT) successfully demonstrated the use of CO<sub>2</sub> mineralized concrete on the Kapolei Interchange in May 2019, and has introduced language into its concrete specifications to standardize the use of CO<sub>2</sub> mineralized concrete on HDOT developments.

Resolution HB 1846 supports the ambitious climate goals set by the State of Hawai'i while enhancing the local market for clean technologies. We submit our strong support for this resolution for the following reasons:

- 1. It takes an economically responsible approach to addressing greenhouse gas emissions:** Improving the energy efficiency of existing buildings is widely acknowledged to be one of the fastest and most cost-effective strategies for decarbonization<sup>2,3</sup>. Reducing the energy consumption of public buildings will achieve emissions reductions while reducing the cost of utility bills. The use of CO<sub>2</sub> mineralized concrete can reduce operational costs and unlock new production efficiencies for concrete producers, providing a market-ready solution to drive down emissions in this hard to decarbonize industrial sector.

<sup>1</sup> [Cleantech Group](#)

<sup>2</sup> [Natural Resources Defense Council](#)

<sup>3</sup> [International Energy Agency](#)

2. **It fosters innovation in clean technologies:** Carbon utilization technologies such as CO<sub>2</sub> mineralized concrete are expected to become a \$1 trillion industry by the year 2030. Similarly, electric vehicles are expected to account for more than 30% of global passenger vehicles by 2040<sup>4</sup>. This resolution positions the State of Hawai'i to capitalize on emerging technology trends and proactively design and plan for this future reality.
3. **It will achieve emissions reductions and demonstrates the State's commitment to the Paris Climate Accord:** In June 2017, Hawai'i Governor David Ige signed SB 559<sup>5</sup>, reaffirming commitment to the principles of the Paris Accord and aligning climate mitigation efforts with achieving the goals of the Accord. This resolution outlines a suite of actions that will reduce both operational emissions and embodied carbon emissions. Concrete is the most widely used construction material in the world; however 7% of the emissions associated with concrete come from cement production<sup>6</sup>. In 2017, Hawai'i imported around 300,000 tons of cement from Taiwan<sup>7</sup>. The importing of cement leads to additional costs in shipping, which then leads to a larger footprint. With mineralization, concrete development can reduce up to 700 megatons of annual global emissions.
4. **It promotes transparency:** By requiring continual energy audits and reporting of energy consumption, this resolution will place data in the hands of elected officials to better inform decision-making on behalf of all Hawaiians.

Mahalo for the opportunity to testify on this resolution.

Sincerely,

**Robert Niven**

CEO & Founder

CarbonCure Technologies, an Elemental Excelerator cohort company

[rniven@carboncure.com](mailto:rniven@carboncure.com)

<sup>4</sup> [BloombergNEF](#)

<sup>5</sup> [Hawai'i SB 559](#)

<sup>6</sup> [Global Roadmap for Implementing CO<sub>2</sub> Utilization](#)

<sup>7</sup> [North American Cement Imports](#)

**HB-1846**

Submitted on: 1/29/2020 8:51:32 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Noel Morin	Hawaii Electric Vehicle Association and Big Island Electric Vehicle Association	Support	No

Comments:

**LATE**

Dear Chair Lowen, Vice Chair Wildberger, and members:

I support HB 1846.

New buildings offer many opportunities to save energy and move Hawaii closer to our goal of zero emissions.

I support the various energy savings methods proposed in HB1846, particularly the requirement for new buildings to incorporate electric vehicle charging infrastructure so that they are charger – ready. This will allow our new construction to be future-proofed. It will cost a lot less to build in the capability vs having to do a retrofit.

I'd like to also suggest that we do something similar for Solar photovoltaic (PV) capacity. Building designs should incorporate space for PV systems. Please consider including this in the bill.

The other strategies, i.e., the use of new concrete like Carbon Cure's (carboncure.com) will allow for construction to be less carbon intensive.

Please support it. HB 1846.

Sincerely,

Noel Morin

President - Hawaii Electric Vehicle Association and Big Island Electric Vehicle Association

808 987-7428

**HB-1846**

Submitted on: 1/29/2020 1:15:22 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Alexandra Kahn	Surfrider Oahu	Support	No

Comments:



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183 Pinana St., Kailua, HI 96734 • 808-262-1285 • [info@350Hawaii.org](mailto:info@350Hawaii.org)

To: The House Committee on Energy & Environmental Protection  
From: Brodie Lockard, Founder, 350Hawaii.org  
Date: Thursday, January 30, 2020, 8:30 am

**In strong support of HB 1846**

Dear Chair Lowen, Vice Chair Wildberger, and members:

350Hawaii.org supports HB 1846.

New buildings offer many opportunities to save energy and move Hawaii closer to our goal of zero emissions.

Concrete's essential ingredient, cement, has a huge carbon footprint. Making cement requires superheating limestone, and releases massive amounts of carbon dioxide. Cement is responsible for 7% of global man-made greenhouse gas emissions, making it the world's second largest industrial source of CO<sub>2</sub>. But new types of concrete can reduce the need for cement, and even trap CO<sub>2</sub> emissions forever at the same time.

[<https://money.cnn.com/2018/06/12/technology/concrete-carboncure/index.html>]

Using this type of concrete actually makes a new building decrease emissions.

Requiring new buildings' parking lots to be electric vehicle (EV) ready promotes EV adoption by providing additional places for EV owners to charge.

They can also be net zero, using no additional energy when taking into account their design, construction materials and methods, and all of their energy use, savings and production.

New buildings can provide space for rooftop photovoltaic systems, and every new building in Hawaii should be equipped with PV. Please add this requirement in this bill.

HB 1846 sets examples by using all of these energy-savings methods in new state buildings. Please support it.

Brodie Lockard  
Founder, 350Hawaii.org

**HB-1846**

Submitted on: 1/28/2020 5:27:17 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Andrea Quinn	Individual	Support	No

Comments:

Dear Honorable Committee Members:

Please support HB1846. Energy efficiency will help mitigate climate change, which is already occurring.

Thank you for the opportunity to present my testimony.

Andrea Quinn

Kihei

**HB-1846**

Submitted on: 1/29/2020 5:55:11 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Lynn Aaberg	Individual	Support	Yes

Comments:

Please support this bill. It offers more opportunities for the state to help combat the climate crisis, leading the way in energy efficient buildings. Providing parking for electric cars and charge stations (which ultimately should be carbon neutral when using the sun's free electrons in solar power!) We must make real change to show our commitment to helping the climate crisis. And yes, it will save money in terms of actual energy cost as well as in the hidden costs that are not always calculated when we preserve the climate.



**HB-1846**

Submitted on: 1/29/2020 8:12:54 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Jan Barosh	Individual	Support	No

Comments:

**HB-1846**

Submitted on: 1/28/2020 11:25:37 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Phaethon Keeney	Individual	Support	No

Comments:

Please support HB1846, mahalo!

**HB-1846**

Submitted on: 1/29/2020 10:40:59 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

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

**LATE**

Comments:

I support HB 1846.

New buildings offer many opportunities to save energy and move Hawaii closer to our goal of zero emissions.

Concrete's essential ingredient, cement, has a huge carbon footprint. Making cement requires superheating limestone, and releases massive amounts of carbon dioxide. Cement is responsible for 7% of global man-made greenhouse gas emissions, making it the world's second largest industrial source of CO2. But new types of concrete can reduce the need for cement, and even trap CO2 emissions forever at the same time. [\[https://money.cnn.com/2018/06/12/technology/concrete-carboncure/index.html\]](https://money.cnn.com/2018/06/12/technology/concrete-carboncure/index.html)

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New buildings can provide space for rooftop photovoltaic systems, and every new building in Hawaii should be equipped with PV. Please add this requirement in this bill.

HB 1846 sets examples by using all of these energy-savings methods in new state buildings. Please support it.

**HB-1846**

Submitted on: 1/28/2020 11:09:13 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Caroline Kunitake	Individual	Support	No

Comments:

Please support HB1846.

Mahalo,

Caroline Kunitake

**HB-1846**

Submitted on: 1/29/2020 7:20:41 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Meredith Buck	Individual	Support	No

Comments:

I support this bill.

**HB-1846**

Submitted on: 1/29/2020 9:01:37 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
J Riverstone	Individual	Support	No

Comments:

**HB-1846**

Submitted on: 1/29/2020 4:40:24 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Nanea Lo	Individual	Support	No

Comments:

Hello,

My name is Nanea Lo and I'm a lifelong resident of Hawai'i on the island of O'ahu. I am also a masters student at the university of Hawai'i at MÄ• noa in the Department of Urban and Regional Planning. I fully support this bill.

me ke aloha 'Ä• ina,

Nanea Lo

**HB-1846**

Submitted on: 1/29/2020 9:00:15 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
william metzger	Individual	Support	Yes

Comments:



**HB-1846**

Submitted on: 1/29/2020 8:02:06 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Julie Stowell	Individual	Support	No

Comments:

**HB-1846**

Submitted on: 1/29/2020 8:34:37 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Janet Pappas	Individual	Support	No

Comments:

**HB-1846**

Submitted on: 1/29/2020 9:53:20 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Karen Shimizu	Individual	Support	No

Comments:

**HB-1846**

Submitted on: 1/29/2020 10:53:45 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
ChristopherMcCullough	Individual	Support	No

Comments:

**HB-1846**

Submitted on: 1/29/2020 11:18:40 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Javier Mendez-Alvarez	Individual	Support	No

Comments:

**HB-1846**

Submitted on: 1/29/2020 3:24:59 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Joshua Brown Clay	Individual	Support	No

Comments:

**HB-1846**

Submitted on: 1/29/2020 3:09:21 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Stephanie Hall Morin	Individual	Support	No

Comments:

Driving electric vehicles allows the State of Hawaii to set the stage for the residents to make the change to cleaner energy travel options.

**HB-1846**

Submitted on: 1/29/2020 3:58:48 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Chris Mentzel	Individual	Support	No

Comments:



**HB-1846**

Submitted on: 1/29/2020 7:13:45 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Sherry Pollack	Individual	Support	No

Comments:

**HB-1846**

Submitted on: 1/29/2020 7:24:14 PM

Testimony for EEP on 1/30/2020 8:30:00 AM

Submitted By	Organization	Testifier Position	Present at Hearing
Linda Morgan	Individual	Support	No

Comments:

**LATE**

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Please support HB1846.

**HB-1846**

Submitted on: 1/30/2020 8:36:11 AM

Testimony for EEP on 1/30/2020 8:30:00 AM

**LATE**

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Lana Rose Olson	Individual	Support	No

Comments: