



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

House Committee on Education

Monday, March 21, 2016
2:30 P.M.
Hawaii State Capitol, Room 309

Senate Bill 2604, SD1, Relating to a Microgrid Pilot Project for Schools

Dear Chair Takumi, Vice Chair Ohno, and Members of the Committee:

The Board of Education ("Board") voted to testify in support of the intent of Senate Bill 2604 SD1, which would establish an off-grid microgrid pilot project through the Department of Education's Ka Hei program.

The Board has been actively monitoring the Department of Education's efforts to increase the amount of renewable energy it purchases while reducing its consumption through energy efficiencies. The Board supports any program that will allow the Department of Education to reach its long-term sustainability, renewable energy, and energy efficiency goals.

Thank you for this opportunity to testify on behalf of the Board.

Very truly yours,

A handwritten signature in cursive script that reads "Lance A. Mizumoto".

Lance A. Mizumoto
Chairperson



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

Date: 03/21/2016
Time: 02:30 PM
Location: 309
Committee: House Education

Department: Education

Person Testifying: Kathryn S. Matayoshi, Superintendent of Education

Title of Bill: SB 2604, SD1 RELATING TO A MICROGRID PILOT PROJECT FOR SCHOOLS.

Purpose of Bill: Requires the department of education to establish an off-grid microgrid pilot project through the Ka Hei program at a school of its choosing. (SD1)

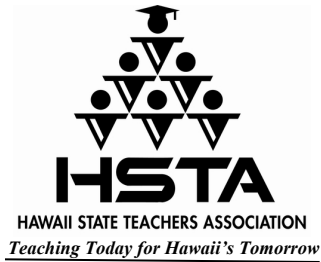
Department's Position:

The Department of Education (DOE) supports this bill. The DOE has been engaged in an aggressive program to increase the amount of renewable energy it purchases as well as drive down consumption through energy efficiencies. As this program, called Ka Hei progressed, it has become clear that in order to take sustainability 'to the next level' it is necessary to look at strategies beyond renewable energy generation and energy efficiency - strategies such as microgrids.

Because microgrids are defined as 'a group of interconnected loads and distributed energy within defined electrical boundaries and can act as single controllable entities with respect to the utility grid', the establishment of microgrids at various schools sites can become integral components to an improved, more robust and flexible electrical utility.

As such, microgrids are aligned with the DOE's overall long range strategies regarding sustainability, renewable energy, and energy efficiency.

Thank you for the opportunity to provide this testimony.



1200 Ala Kapuna Street ♦ Honolulu, Hawaii 96819
Tel: (808) 833-2711 ♦ Fax: (808) 839-7106 ♦ Web: www.hsta.org

Corey Rosenlee
President
Justin Hughey
Vice President
Amy Perruso
Secretary-Treasurer
Wilbert Holck
Executive Director

TESTIMONY BEFORE THE HOUSE COMMITTEE ON
EDUCATION

RE: SB 2604, SD1 - RELATING TO A MICROGRID PILOT PROJECT FOR
SCHOOLS.

MONDAY, MARCH 21, 2016

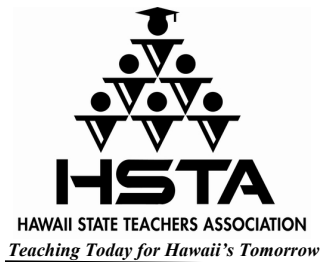
COREY ROSENLEE, PRESIDENT
HAWAII STATE TEACHERS ASSOCIATION

Chair Takumi and Members of the Committee:

The Hawaii State Teachers Association **supports SB 2604, SD1**, relating to a microgrid pilot project for schools.

It's hot in Hawai'i. According to the National Weather Service, our state set over 50 high temperature records this summer, with the heat and humidity lingering well into the start of fall. In our schools, children and teachers alike became ill from the blistering conditions. Kalaheo High School science teacher Micah Pregitzer recorded temperatures as high as 108 degrees inside his classroom last August, telling reporters, "You're dripping in sweat when you're just sitting there grading papers by yourself with no students in the room. You get the room packed with 36, 38, sometimes 40 students, and it just boosts that temperature up even higher."

A recent study conducted by University of California at Los Angeles researchers showed that the percentile gap between students learning in air conditioned and non-air-conditioned environments can reach as much as 17 percent on achievement tests, clearly evincing the impact of a comfortable classroom environment on student success. In a longitudinal analysis contained in "Effects of the Physical Environment on Student Learning," moreover, Glen I. Earthman of Virginia Polytechnic Institute and State University found that students between 4th and 9th grade at demographically similar schools showed increased gains in reading



1200 Ala Kapuna Street ♦ Honolulu, Hawaii 96819
Tel: (808) 833-2711 ♦ Fax: (808) 839-7106 ♦ Web: www.hsta.org

Corey Rosenlee
President

Justin Hughey
Vice President

Amy Perruso
Secretary-Treasurer

Wilbert Holck
Executive Director

vocabulary, total math, problem solving, math procedures, pre-writing, and editing at schools with air conditioning, as compared with peers from non-cooled schools.

Earthman demonstrated that the longer and more consistently students are exposed to classroom cooling, the better and more stable their performance gains tend to be. Conversely, students exposed to thermal conditioning for only short or intermittent periods of time achieved less than their peers. These findings are supported by U.S. Department of Education sponsored research, which claims that proper cooling systems lead to better attitudes toward learning, fewer disciplinary problems, and sustained achievement.

We applaud Gov. David Ige's call to cool 1,000 classrooms within the next two years. While previous department of education estimates put the cost of comprehensive air conditioning at \$1.5 billion, that figure has been fallen as investments in experiments with renewable energy technology have proven fruitful. Furthermore, in conversations with photovoltaic companies, advocates for cool schools have learned that employing off-grid DC-powered air conditioners, operated entirely from photovoltaic modules that store energy in power-saving batteries, could cost between \$15,000 to \$30,000 per classroom, a savings of approximately 70 percent from earlier departmental projections.

Accordingly, HSTA supports all efforts to provide climate control to classrooms using renewable energy technology. We believe, as the preamble to this bill states, that microgrids provide many benefits, including power security when an electrical grid falters, integration of clean and renewable energy, advancement of environmental standards, reduction of grid congestion, and localization of energy production. The DOE's Ka Hei program, through a public-private partnership with OpTerra Energy Services, already provides technical and financial expertise to help reduce energy costs throughout the department, making the program an ideal and economical generator of clean energy cooling and scientific learning.

School should be cool. To improve air conditioning facilities and, in turn, boost student learning, the Hawaii State Teachers Association asks your committee to **support** this bill.

**Testimony before the
House Committee on Education**

**March 21, 2016, 2:30 pm
Conference Room 309**

S.B. No. 2604, S.D. 1 – Relating to a Microgrid Pilot Project for Schools

**By Scott Seu
Vice President, System Operation
Hawaiian Electric Company, Inc.**

Chair Takumi, Vice-Chair Ohno and Members of the Committee:

My name is Scott Seu. I am Vice President for System Operation at Hawaiian Electric Company. I am testifying on behalf of Hawaiian Electric and its subsidiary utilities, Maui Electric and Hawaii Electric Light (collectively “Companies”).

This bill should be amended to require that the microgrid pilot project be capable of both on-grid and off-grid operation. The optimal microgrid is one that not only serves the needs of the microgrid owner but also can benefit all customers by complementing the operation of the regular grid, such as through demand response programs or other grid support activities. Participation in such programs increases overall societal benefits and supports the entire State in reaching its renewable energy goals, not to mention can provide additional revenues to the microgrid owner. Such a microgrid operates connected to the regular grid during normal conditions, but during emergencies like sustained power outages, the microgrid can be designed to separate from the regular grid and operate independently for resiliency purposes. The bill should be amended to reflect this operational structure, as opposed to requiring that the microgrid be off-grid at all times.

Microgrids should be explored in a flexible manner that seeks to maximize benefit to the Department of Education and to the rest of Hawaii’s electric customers.

Thank you for this opportunity to testify.



OPTERRA
ENERGY SERVICES

1099 Alakea Street #2500
Honolulu, HI 96813

Testimony to the House Committee on Education
Monday, March 21, 2016 9:40 AM
Conference Room 309, State Capitol
RE: SB 2604, SD1 (HSCR1090-16) RELATING TO A MICROGRID PILOT PROJECT FOR SCHOOLS

Chair Takumi, Vice-Chair Ohno, and Members of the Committee on Education:

Opterra Energy Services, (“Opterra”) **supports** SB 2604, SD1 (HSCR1090-16), which requires the Department of Education to establish an off-grid microgrid pilot project through the Ka Hei program at a school of its choosing.

Opterra is working with the Department of Education to deliver the Ka Hei program, a five-year endeavor launched in 2014. The program will integrate innovative energy technology with meaningful learning experiences, all while reducing energy costs. As a comprehensive energy and sustainability program, Ka Hei will transform the learning environment, reduce operational expenses and provide engaging educational opportunities for our students and community.

Opterra supports this bill, which requires the establishment an off-grid microgrid pilot project through the Ka Hei program at a school of its choosing.

There are numerous advantages in establishing microgrid facilities at schools. First, microgrids can store energy produced during the day and use it at night, allowing the school to reach a net zero footprint that help reach our goal of 100% RPS. A net-zero energy campus produces all of the energy needed through clean, renewable energy on an annual basis.

This is a currently a challenge for the schools as changes to the net energy metering program no longer allow for the rollover of credits from month to month. Given there is a lot of solar production in the summer when the schools are not in session, this energy is lost without new and innovative solutions.

Microgrids also increase energy resiliency, which is critical since over 200 schools serve as evacuation centers. In New Jersey in the wake of Superstorm Sandy, schools were identified as being one of several different public facilities that could benefit from the installation of microgrids to improve energy resiliency.

In addition, renewable energy is needed to sustain energy requirements for added load from new technologies to support 21st century learning such as computers, monitors, and heat abatement. Being able to properly size the renewable energy systems after maximizing energy efficiency first is critical.

The Standard Interconnection Application (SIA) process with the utility typically takes 12 – 18 months from initial submission until decision. The utility could deny the application for a number of reasons, which is why an off-grid microgrid provides certainty in avoiding a negative decision and setting the Department backwards in their pursuit of Board policy to achieve 90% clean energy by 2040.

Thank you for the opportunity to testify.



March 21, 2016

Representative Roy Takumi, Chair
Representative Takashi Ohno, Vice Chair
House Committee on Education

Comments and Proposed Amendments to SB 2604, SD1 Relating to A Microgrid Project for Schools. (Requires the Department of Education to establish an “*off-grid*” microgrid pilot project through the Ka Hei program at a school of its choosing.)

EDN Hearing: Monday, March 21, 2016, 2:30 p.m., Conf. Rm. 309

The Land Use Research Foundation of Hawaii (LURF) is a private, non-profit research and trade association whose members include major Hawaii landowners, developers and a utility company. One of LURF’s missions is to advocate for reasonable, rational and equitable land use planning, legislation and regulations that encourage well-planned economic growth and development, while safeguarding Hawaii’s significant natural and cultural resources and public health and safety.

LURF appreciates the opportunity to express its support for the intent of SB 2604, SDS1, and **COMMENTS AND PROPOSED AMENDMENTS** to require DOE’s microgrid pilot project to be capable of both *on-grid* and *off-grid* operation.

SB 2604, SD1. The current measure would require the Department of Education (DOE) to establish only an *off-grid* microgrid pilot project through its Ka Hei program at a school of its choosing.

LURF’s Position. Based on the comments below, LURF believes that in the best interests of the DOE and the public, **SB 2604 , SD1, should be amended** to require DOE’s microgrid pilot project to be capable of both *on-grid* and *off-grid* operation.

LURF understands that the proposed DOE microgrid project is meant to address the current high electricity usage and costs at DOE schools and further expected increased costs due to future plans to install heat abatement measures at DOE schools for an improved learning environment.

The DOE microgrid project is also desirable because DOE schools are currently vulnerable to power grid failures during a disaster or emergency, notwithstanding the fact that many DOE schools also serve as emergency shelters and disaster response centers during hurricanes, and other natural disasters and civic emergencies.

The bill proposes to develop DOE's pilot microgrid project through its Ka Hei program, which is designed to boost student success through the implementation of renewable energy sources, campus modernization, and increased real-world educational opportunities in science, technology, engineering, and math.

LURF understands that microgrids are a group of interconnected loads and distributed energy within defined electrical boundaries that can act as single controllable entities with respect to the power grid. Using microgrids to provide energy to DOE schools can lower DOE's electricity costs; reduce the load on the island's power grid; provide reliable energy to a school site/disaster response center during emergencies, and help the State progress toward its renewable portfolio standard goal of one hundred per cent by 2045.

While the Department of Education may not be able to install and use microgrids at all public schools immediately, the establishment of a microgrid pilot project will provide the DOE with the information it needs to eventually install and use microgrids across all public schools effectively and efficiently.

LURF supports the intent of this bill; and a proposed amendment to require that DOE's microgrid pilot project be capable of both on-grid and off-grid operation, which would provide the "*best of both worlds*" for DOE – as its microgrid could operate connected to the regular grid during normal conditions and take advantage of the electric utilities' expertise, infrastructure and services, but during emergencies like sustained power outages or natural disasters, the microgrid can be designed to separate from the regular grid and operate independently for resiliency purposes. This measure should be **amended** to reflect this dual operational structure, as opposed to requiring that the microgrid be *off-grid* at all times.

For the above reasons, LURF **supports the amendment of SB 2604, SD1**, and respectfully urges your favorable consideration.

Thank you for the opportunity to present testimony regarding this matter.