

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com



March 29, 2018

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The Honorable Donovan M. Dela Cruz, Chair
and Members
Committee on Ways and Means
Hawaii State Capitol, Room 208
Honolulu, Hawaii 96813

Dear Chair Dela Cruz and Members:

Subject: House Bill 635, HD 1, SD 1, Relating to the Issuance of Special Purpose Revenue Bonds for the Nuuanu Hydroelectricity Project

The Board of Water Supply (BWS) strongly supports House Bill (HB) 635, HD1, SD1, which authorizes the issuance of special purpose revenue bonds under Part XII, Chapter 39A, Hawaii Revised Statutes, assisting dam and reservoir owners for the purpose of repairing and upgrading Nuuanu Reservoir No. 4 to meet State dam safety standards and provide adequate flood control for Nuuanu communities along Nuuanu Stream from Nuuanu Dowsett to Honolulu Harbor.

Nuuanu Reservoir No. 4 is an earthen dam constructed in 1910, 66 feet high, 1,730 feet wide and retains 1,173 million gallons. The reservoir construction includes dredging, replacement of intake tower gates, embankment restoration, and access road and suspension bridge repairs. The construction cost estimate is approximately \$6 million.

In February 2018, the BWS representatives met with the Nuuanu Dowsett communities and members of Hui Malama Auwai O Nuuanu to discuss the regulatory repairs of Nuuanu Reservoir No. 4. The Nuuanu communities understand and support the dam repairs project.

When the dam repairs are completed and the opportunity presents itself at a future point, the Nuuanu hydro-electric power generation and managed aquifer recharge project feasibility study and environmental assessment project will be initiated and additional community outreach and field surveys will occur.

Thank you for your consideration of our testimony on House Bill 635, HD1, SD1.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer



ONE WORLD ONE WATER
677 Ala Moana Blvd, Suite 1100
Honolulu, HI 96713

Testimony in Support of H.B. 635 HD1 SD1
Relating to the Nuuanu Hydroelectricity Project

Senate Committee on Ways and Means
March 29th, 2018
10:50am
Conference Room 211

Subject: House Bill (HB) 635 Relating to the Issuance of Special Purpose Revenue Bonds for the Nuuanu Hydroelectricity Project

Aloha Chair Dela Cruz, Vice Chair Keith-Agaran, and Members of the Senate Committee on Ways and Means,

At One World One Water we are dedicated to reinvesting in water infrastructure and restoring natural environments, and **we strongly support HB635 HD1 SD1** which will help produce clean energy in Hawaii while increasing flood control and dam safety. This measure will also help enhance groundwater recharge in the upper Nu'uuanu watershed, which will help Hawaii recharge more water back into our aquifers. Freshwater resources are already constrained in Hawaii and will only become more limited as climate change persists, meaning we must act now to promote natural water recharge.

This bill will help Hawaii reach both the renewable energy goals of the state and the water goals of the Fresh Water Initiative, so as an organization committed to improving our water system **we ask your support of HB635 HD1 SD1** to invest in Hawaii's future.

Please contact us at globalwater@gmail.com should you have any questions or require additional information regarding this matter.

Sincerely,
One World One Water



Email: communications@ulupono.com

SENATE COMMITTEE ON WAYS & MEANS
Thursday, March 29, 2018 — 10:50 a.m. — Room 211

Ulupono Initiative Strongly Supports HB 635 HD 1 SD 1, Relating to the Issuance of Special Purpose Revenue Bonds for the Nuuanu Hydroelectricity Project

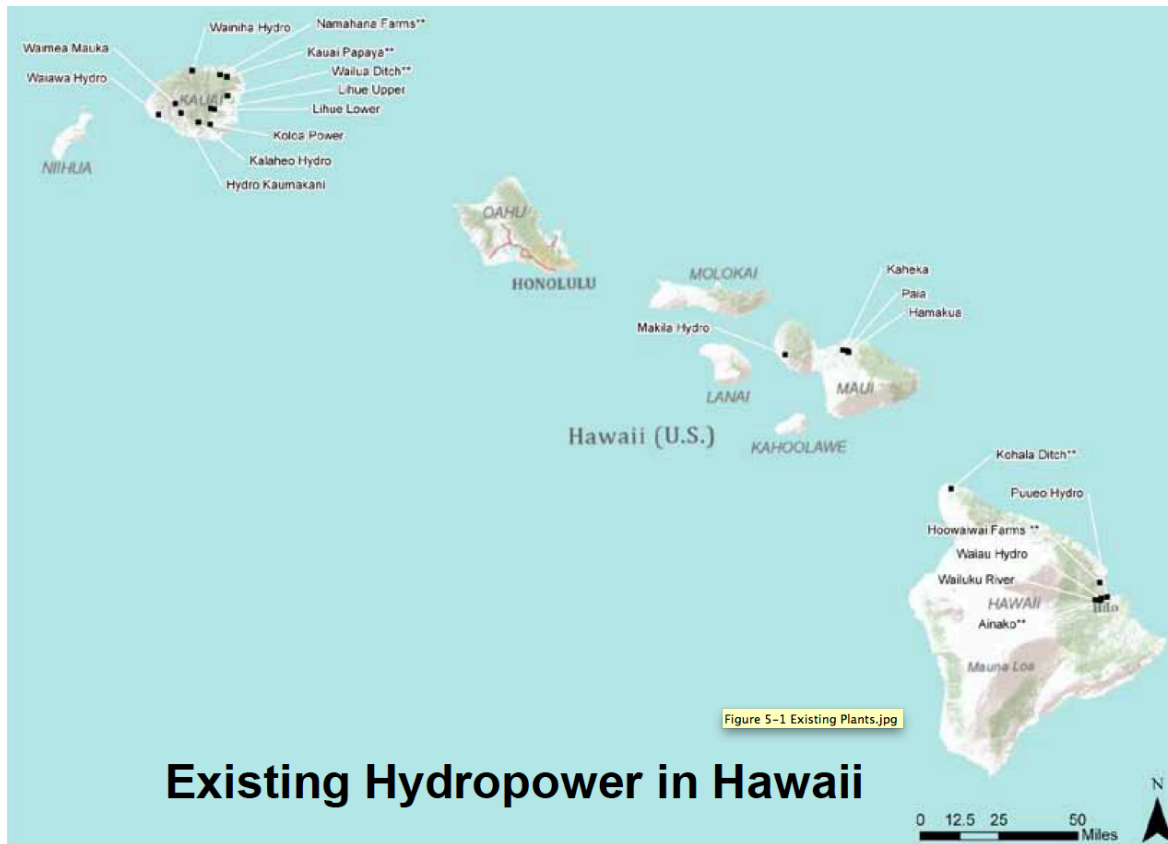
Dear Chair Dela Cruz, Vice Chair Keith-Agaran, and Members of the Committee:

My name is Kyle Datta and I am General Partner of Ulupono Initiative, a Hawai'i-based impact investment firm that strives to improve the quality of life for the people of Hawai'i by working toward solutions that create more locally produced food; increase affordable, clean, renewable energy; and better management of waste and fresh water. Ulupono believes that self-sufficiency is essential to our future prosperity and will help shape a future where economic progress and mission-focused impact can work hand in hand.

Ulupono strongly supports HB 635 HD 1 SD 1, which authorizes special purpose revenue bonds for upgrading Nuuanu Reservoir #4 for a hydroelectric project, because it aligns with our goal of increasing the production of clean, renewable energy in Hawai'i.

Currently, hydroelectric projects exist in all of Hawai'i's counties except Honolulu. Hydroelectric power production is highest on Kauai where it provides 7.5 percent of the island's electricity.

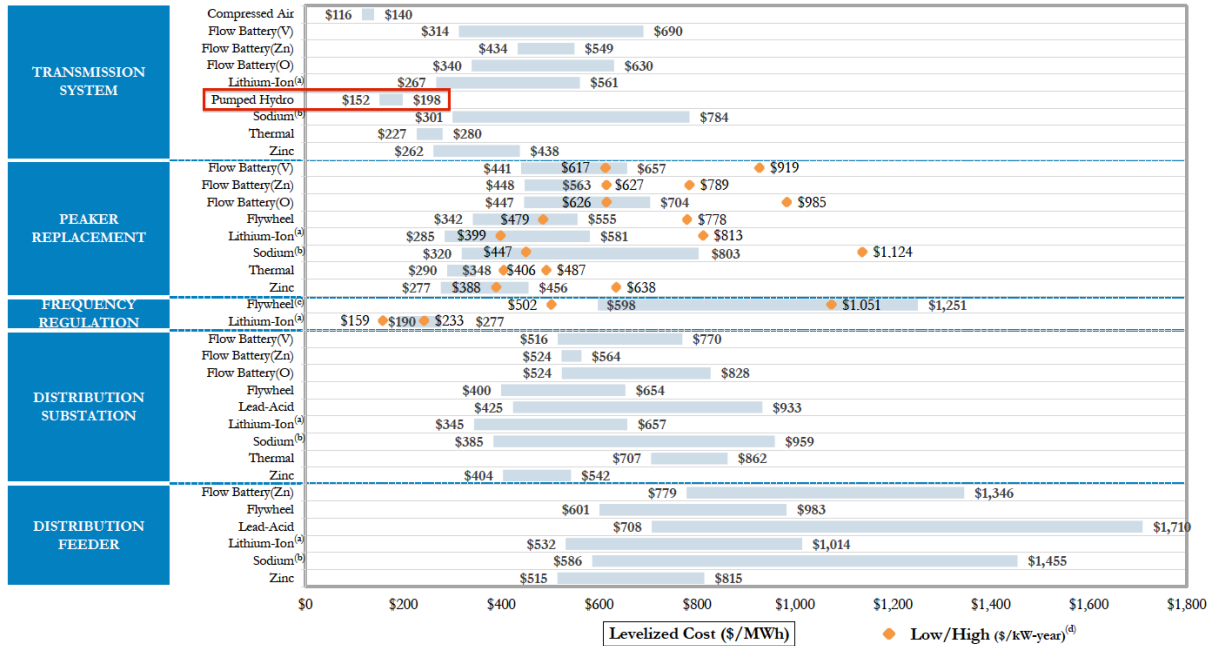
Investing in a Sustainable Hawai'i



The combined statewide hydroelectric plants have a total generating capacity of about 37 megawatts, which is approximately equal to the generating capacity of a 70 megawatt solar farm. Hydroelectric plants also replace 250,000 barrels of oil equivalent. Hydroelectric plants statewide would represent 1.67 percent of O‘ahu’s 2016 generating capacity and roughly 0.49 percent of the state’s primary energy production.

While this project is currently slated for hydroelectric and aquifer recharge, Ulupono also believes this project could serve as a pumped storage hydro facility. Pumped storage hydro is one of the cheapest forms of energy storage currently available. The chart below indicates the price ranges for different types of energy storage.

Unsubsidized Levelized Cost of Storage Comparison



Source: Lazard and Enovation Partners estimates.

Note: Flow Battery(V) represents Vanadium Flow Batteries; Flow Battery(Zn) represents Zinc-Bromine Flow Batteries; Flow Battery(O) represents Other Flow Batteries. Lazard's LCOS v1.0 study did not separately analyze each of these distinct technologies within Flow Battery.

- (a) Lithium-Ion-Power technology used in the Frequency Regulation and Microgrid Use Cases due to low duration/high power requirements. Lithium-Ion-Energy systems are used in all other Use Cases that include Lithium-Ion technology.
- (b) Sodium-Low Temperature systems are used in Commercial Appliance and Residential Use Cases. Sodium-High Temperature systems are used in all other Use Cases that utilize Sodium technology.
- (c) Flywheel storage in the Frequency Regulation Use Case represents short-duration storage. Flywheel storage in all other Use Cases represents long-duration storage.
- (d) Reflects conversion of LCOS figure (\$/MWh) by multiplying by total annual energy throughput (MWh) and dividing by capacity (kW).

With high intermittent renewable energy production, Hawai'i requires more energy storage to increase its use of additional renewable energy sources. Yet, there are few locations, particularly on O'ahu where power demand is highest amongst all Hawai'i counties, that a pumped storage hydro project makes topographic and economic sense. Nuuanu reservoirs provide an opportunity to develop a needed energy project using reservoir infrastructure that exists.

As Hawai'i's energy issues become more complex and challenging, we appreciate these committees' efforts to look at policies that support renewable energy production.

Thank you for this opportunity to testify.

Respectfully,

Kyle Datta
General Partner



HAWAI'I COMMUNITY FOUNDATION
Amplify the Power of Giving

**Testimony of the Hawaii Community Foundation on HB635 HD1 SD1
Relating to the Nu'uau Hydroelectricity Project
Senate Committee on Ways and Means
Thursday, March 29th, 2018
10:50am
Conference Room 211**

Aloha Chair Dela Cruz, Vice Chair Keith-Agaran, and Members of the Senate Committee on Ways and Means,

The Hawaii Community Foundation (HCF) strongly supports **HB635 HD1 SD1**, which relates to the issuance of special purpose revenue bonds for the Nu'uau Hydroelectricity Project.

As Hawaii is gradually getting less precipitation as the climate changes, initiatives that help increase groundwater recharge are becoming increasingly important. Hawaii Community Foundation is currently coordinating the Fresh Water Initiative, which includes a goal of increasing water recharge by 30 million gallons per day. HCF is in support of **HB635 HD1 SD1** since it not only helps increase water recharge for the Nu'uau Watershed but it will also help generate renewable energy for the state. Additionally, this bill might assist in bringing the dam facility up to more stringent safety standards.

HCF strongly supports **HB635 HD1 SD1** and we stand ready to collaborate and assist in moving Hawaii towards increased water reuse and strengthened water security.