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Testimony of **MARK B. GLICK, Chief Energy Officer**

before the
SENATE COMMITTEE ON ENERGY , ECONOMIC DEVELOPMENT, AND TOURISM

Thursday, March 14, 2024
1:01 PM
State Capitol, Conference Room 229 and Videoconference

In Support of
HB 2103, HD2

RELATING TO LONG DURATION CLEAN ENERGY STORAGE.

Chair DeCoite, Vice Chair Wakai and members of the Committee, I am writing in support of HB 2103, HD2, which relates to long duration clean energy storage.

Longer duration storage technologies will be increasingly important to Hawai'i's energy transition as more renewables are deployed on the grid. At high rates of renewable penetration, such storage enables renewable sources generated during the daytime, such as solar generated power, to be used throughout the night. A long duration clean energy storage investment capital special fund would provide the Hawai'i State Energy Office (HSEO) with seed and venture capital for investments in private sector and federal projects for long duration storage research, development, testing, and implementation.

Long-duration storage, including hydrogen (H₂) and pumped hydroelectric storage, can make renewable energy available in times of need. It further has the potential to act as firm renewable, subject to the storage capacity. Kauai Island Utility Cooperation (KIUC) issued a Power Purchase Agreement (PPA) at \$0.08/kWh PPA for a pumped hydroelectric storage project combining 35MW solar and battery, and 25MW pumped hydro. KIUC estimates project will save over \$150 million compared to fossil fuels for term of PPA.

O'ahu has the potential for pumped hydro at Lake Wilson. Previous estimates show 40MW capacity from Wahiawā, Nu'uānu, and Maunawili reservoirs (USDOE and DBEDT 1981).

The measure as written provides sufficient flexibility to pursue electrochemical, mechanical, thermal, chemical carriers, or any combination that has the potential to meet the necessary duration and cost targets for grid flexibility. The changes also preserve the crucial role of hydrogen pursuant to the original intent of the renewable hydrogen program but broadens it appropriately to include all long duration storage options.

Thank you for the opportunity to testify.



Environmental Caucus of
The Democratic Party of Hawai'i

Energy & Climate Action Committee

Thursday, March 14, 2024, 1:01 pm

Senate Committee on Energy, Economic Development and Tourism, and on and Environmental Protection

HOUSE BILL 2103 HD2 – RELATING TO LONG DURATION CLEAN ENERGY STORAGE

Position: **Strong Support**

Me ke Aloha Chair DeCoite, Vice-Chair Wakai, and members of the Senate Committee on Energy, Economic Development and Tourism, and on and Environmental Protection:

HB2103 HD2 Broadens Hawaii's capital special fund to include a broader focus on long duration clean energy storage.

Energy and Climate Action Committee strongly supports this measure. This is the true meaning of firm, renewable energy, and enables Hawaii to take advantage of federal efforts to support the transition away from polluting energy fuels.

Our committee has long been advocating for adequate energy storage to make Hawaii more energy secure.

It is interesting that the platform for accomplishing these efforts is a transformation of what was called the hydrogen investment capital special fund. We take a dim view of the so-called hydrogen proposals, which embrace an unproven, very expensive technology, fully dependent on using fossil fuels to produce this expensive energy, continuing dependence on fossil fuels and continuing the atmospheric pollution creating climate change. We simply cannot countenance such misguided efforts.

However, use of this vehicle to generate true energy security through truly firm renewable energy sources is exactly what Hawaii needs. Long duration energy storage is the ticket to firm, reliable energy.

Mahalo for providing the opportunity to address this matter.

/s/ Charley Ice, Chair, Energy and Climate Action Committee
Environmental Caucus of the Democratic Party

LATE

HB-2103-HD-2

Submitted on: 3/13/2024 12:54:43 PM

Testimony for EET on 3/14/2024 1:01:00 PM

Submitted By	Organization	Testifier Position	Testify
Sherry Pollack	Individual	Comments	Written Testimony Only

Comments:

It is very concerning that several critical issues related to hydrogen are missing from the considerations as set forth in this measure. These issues and concerns include:

1. Safety issues. Hydrogen has **major safety issues**. It is highly flammable. It can be ignited by cell phones or by electrical storms located miles away. Leaks pose a significant fire hazard, particularly because they are hard to detect. Furthermore, hydrogen burns nearly invisibly, and people have unwittingly stepped into hydrogen flames. Moreover, hydrogen can cause many metals, including the carbon steel widely used in gas pipelines, to become brittle. In addition, any high-pressure storage tank presents a risk of rupture.

2. Hydrogen production is very water intensive. The process also uses more water for cooling, water treatment, and disposal. Considering our dwindling freshwater supplies, this is a major issue. Even if seawater is used, companies will have to remove the salt through **desalination**, a process that **demands a lot of water and power**. It is important to note that desalination **dumps a lot of waste back into the ocean**. That includes hot discharge, which can kill sea life, lethal chemicals, and suffocating concentrations of salt. Methods that aim to prevent these threats to vital ecosystems have a mixed record on actually working.

3. When water is used to electrolyze into hydrogen and oxygen it is extremely energy-intensive. In fact, it takes more energy to produce hydrogen through electrolysis than hydrogen produces when converted to useful energy. Using solar or wind energy to produce another fuel right now is a waste of precious renewables that could be used to meet our electricity needs. It is always more efficient to use renewable power directly than to convert renewable energy to hydrogen for use as an energy source.

4. Hydrogen is very prone to leakage. And while hydrogen is not directly a greenhouse gas, its chemical reactions change the abundances of the greenhouse gases methane, ozone, and stratospheric water vapor, as well as aerosols. As a result, it has a warming potential around 37.3

times greater than emitted CO₂ over a 20-year time period.
(<https://www.nature.com/articles/s43247-023-00857-8>)

5. Hydrogen combustion can produce dangerously high levels of nitrogen oxide which is a significant public health problem, including causing serious respiratory illnesses. Even low levels of nitrogen oxides in the air can irritate your eyes, nose, throat, and lungs, possibly causing you to cough and experience shortness of breath, tiredness, and nausea.

The above are just some of the concerns with hydrogen technology.

In summary, before the legislature lunges forward with investing our tax dollars, it is crucial that these critical issues be researched and addressed.

Mahalo for the opportunity to testify.