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Testimony of
MARK B. GLICK, Chief Energy Officer

before the
**SENATE COMMITTEES ON
ENERGY, ECONOMIC DEVELOPMENT, AND TOURISM
AND
COMMERCE AND CONSUMER PROTECTION**

Tuesday, February 13, 2024
9:00 AM
State Capitol, Conference Room 229 and Videoconference

Providing Comments on
SB 2964

RELATING TO RENEWABLE ENERGY.

Chairs DeCoite and Keohokalole, Vice Chairs Wakai and Fukunaga, and members of the Committees, the Hawai'i State Energy Office (HSEO) offers comments in support of the intent of SB 2964 that would (1) modify the definition of "public utility" to remove the specific language that states that "nothing in this section shall be construed to permit wheeling" and (2) add a section to Chapter 269, Public Utilities Commission, that permits independent renewable energy generators to engage in retail wheeling of renewable energy used to produce hydrogen, provided that a "third-party" electric utility shall be fairly compensated in accordance with a tariff adopted by the public utilities commission, via rules adopted pursuant to chapter 91, no later than December 31, 2024.

HSEO agrees that wheeling – including scope, definitions, and what would constitute "fairly compensating the [third-party]¹ utility for utilizing its existing infrastructure" is an appropriate topic for consideration, evaluation and decision-making. As a ratemaking matter, wheeling can have deep and varied impacts to ratepayers and

¹ It should be noted that elsewhere in chapter 269 the term "third-party" refers to an entity that is not the regulated utility (third-party administrator, third-party data access, third-party authorization). If the term "third-party" is not needed here, HSEO recommends its removal.

energy consumers and involves many of the pricing, location, interconnection, and time of transmission issues currently under consideration in proceedings such as the distributed energy resource policies² and performance-based regulation³ dockets.

As contemplated in SB 2964, permitting independent power producers to capture and use curtailed renewable energy, or intermittent renewable energy that cannot be integrated into the grid during times of grid saturation, for the downstream production of hydrogen is a valid concept. While the long-time sentiment in Hawai'i⁴ has been that "wheeling should be addressed at a later time,"⁵ the urgency to reduce and ultimately eliminate the harmful economic impacts of oil price volatility in the transportation and electricity sector makes careful evaluation and consideration of wheeling timely and prudent. Shared solar programs are examples of wheeling that has served the public interest throughout Hawai'i and provided value to ratepayers since passage of the underlying law permitting it in 2015.

Due to the importance and complexity of the topic⁶ among other urgent issues to be decided, particularly in the aftermath of the Maui wildfires, HSEO recommends that the PUC be given discretion to determine the appropriate regulatory proceeding or process that it should undertake, i.e. administrative rules or the docket process assuming the measure is adopted.

Thank you for the opportunity to testify.

² Docket No. 2019-0323, <https://puc.hawaii.gov/energy/der/>

³ Docket No. 2018-0088, <https://puc.hawaii.gov/energy/pbr/>

⁴ Docket No. 2007-0176, opened in 2007, was limited to the wheeling of electricity between governmental entities and did not encompass retail wheeling. That docket was suspended on December 8, 2008, to "allow for the conservation of limited resources." Since many of the interconnection, control, and technical questions were the same, discussion moved to the Reliability Standards Working Group, part of the Feed-in Tariff docket (Docket No. 2008-0273) and has continued since then. The many topics, from power generation (intermittent, firm, dispatchable, in-fill, excess, renewable, emissions); interconnection (location, timing, value, cost, technical feasibility), line capacity (timing, capacity factors, limits, losses, heating, transformers, prioritization, congestion pricing, expansion, location, circuit limits, voltage support), use (time of use, customer class, ratepayer impacts, demand response, aggregator services) have been discussed, quantified, and sometimes set aside for future evaluation in subsequent dockets.

⁵ Hawaiian Electric, Docket No. 2018-0163, Microgrid Working Group ... February 10, 2021, footnote 20: "...as a general matter, the Commission believes retail wheeling will likely require additional discussion after the filing deadline and as such, this issue should be addressed at a later time..."

⁶ Energy Law Journal, https://www.eba-net.org/wp-content/uploads/2023/02/14_25EnergyLJ1612004.pdf

TESTIMONY OF
LEODOLOFF R. ASUNCION, JR.
CHAIR, PUBLIC UTILITIES COMMISSION
STATE OF HAWAII

TO THE
SENATE COMMITTEES ON
ENERGY, ECONOMIC DEVELOPMENT, AND TOURISM
and
COMMERCE AND CONSUMER PROTECTION

February 13, 2024
9:00 a.m.

Chairs DeCoite and Keohokalole, Vice Chairs Wakai and Fukunaga, and Members of the Committees:

MEASURE: S.B. No. 2964

TITLE: RELATING TO RENEWABLE ENERGY.

DESCRIPTION: Authorizes independent generators of renewable energy to wheel the renewable energy transmitted and used to produce hydrogen, subject to certain conditions determined by the public utilities commission.

POSITION:

The Public Utilities Commission (“Commission”) offers the following comments for consideration.

COMMENTS:

The Commission appreciates the intent of this measure to promote increased renewable energy production for hydrogen production. The Commission supports examination of diverse measures that would promote the production of clean electricity and understands that generators of renewable energy play an important role in the State’s transition to renewable energy.

The Commission notes that electricity wheeling requires analysis of many complex and interrelated issues to ensure reliability and cost-effectiveness, such as interconnection, availability of transmission and distribution capacity, appropriate rates and rate design,

back-up power requirements, and others. The Commission observes that an investigatory docket would be an appropriate forum to explore whether implementing retail wheeling in Hawaii is feasible and in the public interest. The investigatory docket process allows the opportunity for stakeholders to intervene and collaborate on determining the appropriate rates and procedures for retail wheeling. The Commission previously investigated intragovernmental wheeling in Docket No. 2007-0176, which closed in 2019 and led to the refined focus on microgrids, a form of distribution-level wheeling, in Docket No. 2018-0163.

The Commission's existing authorities allow the ability to open investigatory dockets as resources are available, and the Commission is currently exploring several issues related to wheeling. The following dockets enable compensation mechanisms for renewable energy generators, addressing issues similar to wheeling, that are aligned with its objectives, and that could support the development of a wheeling tariff:

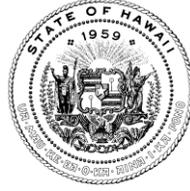
- Docket No. 2015-0389 is the Commission's docket focused on developing community-based renewable energy ("CBRE") programs, which allow customers to receive benefits for "shared solar" installations that are not customer-sited. This proceeding has resulted in over 3 megawatts of shared solar installations, with several additional projects either under construction or under Commission review.
- Docket No. 2018-0163 is the Commission's Microgrid docket, through which the Commission has established a microgrid tariff with rules for hybrid microgrids, in which customers may combine customer-sited equipment with utility-owned infrastructure. In the second phase of the proceeding, the Commission aims to reduce barriers to deploy microgrids across the State and to enable the development of sophisticated microgrids.
- Docket No. 2019-0323 is the Commission's docket for distributed energy resources, which has established compensation structures for customer-sited renewable energy generation, such as solar and storage, connected to Hawaiian Electric's grid to help serve customer resilience and meet grid needs. The newest programs, launching in March, remove system size limits and encourage the development of larger renewable energy systems.
- Docket No. 2020-0204 is considering a "Green Tariff" to allow a wheeling-type arrangement for the University of Hawaii, which could serve as a model for intragovernmental wheeling. The Commission anticipates an update on this proceeding from the parties, including Hawaiian Electric, by March 31st.

The Commission notes that the measure requires that the Commission establish "policies and procedures to implement retail wheeling, including any appropriate rate" by the end

of this year. Given the complexity of the issues associated with wheeling and considering that there are many complementary and interrelated issues currently before the Commission, the Commission respectfully recommends that the requirement to adopt rules to implement retail wheeling by December 31, 2024 be extended to December 31, 2025. This would allow the Commission to open a docket to determine whether retail wheeling is feasible and in the public interest in Hawaii and to determine appropriate implementation policies and procedures. This would be followed by a report to the Legislature no later than twenty days prior to the convening of the regular session of 2026, as currently contemplated in a related bill, S.B. 3194. To achieve this, the Commission would develop a carefully scoped statement of issues and would set and maintain a procedural schedule taking into account that wheeling is already being discussed in PUC dockets aforementioned.

Relatedly, the Commission also observes the similarity in scope between this measure and S.B. 3194, with the primary distinction being the focus of this measure on renewable energy usage for the production of hydrogen. The role of hydrogen in the electric grid and other markets in Hawaii is an important issue that requires further study, particularly regarding the classification of hydrogen as “green” hydrogen. An investigatory docket focused on retail wheeling could also evaluate the end uses of electricity through retail wheeling, such as the production of hydrogen. The Commission recommends that the issue of retail wheeling for hydrogen production be incorporated as part of an investigation into the feasibility of implementing retail wheeling in general.

Thank you for the opportunity to testify on this measure.



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Testimony of the Department of Commerce and Consumer Affairs

Before the
Senate Committee on Energy, Economic Development, and Tourism
And
Senate Committee on Commerce and Consumer Protection
Tuesday, February 13, 2024
9:00 a.m.
Conference Room 229

On the following measure:
S.B. 2964, RELATING TO RENEWABLE ENERGY

Chair DeCoite, Chair Keohokalole, and Members of the Committees:

My name is Michael Angelo, and I am the Executive Director of the Department of Commerce and Consumer Affairs (Department) Division of Consumer Advocacy. The Department offers comments on this bill.

The purpose of this bill is to authorize independent generators of renewable energy to wheel the renewable energy transmitted and used to produce hydrogen, subject to certain conditions determined by the Public Utilities Commission (Commission).

The Department appreciates the bill's intent to advance the development of hydrogen as a renewable energy resource in light of our State's clean energy goals. Since 2007, the Commission has evaluated issues regarding wheeling and, at that time, it was found to be complex and require considerable resources. However, new options have become available. For example, in Docket No. 2020-0204, the Commission is evaluating a pilot that will explore the University of Hawaii's ability to receive the benefits

of a remotely sited renewable energy project, which is akin to the benefits realized under a wheeling program. The Commission also considered the issue of wheeling as part of microgrids in Docket No. 2018-0163. In that docket, the scope of investigating a microgrid services tariff has expanded to include wheeling utilizing the electric utility's infrastructure, this would essentially require a form of wheeling. While procedures in both matters are currently suspended by the Commission, the Department offers that it would be more efficient to move forward with these proceedings than establishing necessary rules regarding the retail wheeling of renewable energy to produce hydrogen as envisioned by this bill.

In addition, aspects of wheeling have been discussed as part of other dockets, such as Docket No. 2019-0323. Through these dockets, appropriate wheeling tariffs can be developed to: (1) enable users to wheel energy from one site to another in a manner that does not adversely affect other customers or the grid; and (2) fairly compensate the utility for using their transmission and distribution facilities to enable wheeling, so that other customers do not have to unfairly subsidize wheeling activities.

In view of the foregoing, the Department respectfully requests that the Committee considers the work the Commission has already initiated and allow the Commission to carefully complete the above dockets to enable wheeling for all customers. As noted above, establishing wheeling is complex and involves various factors. If allowed to complete the ongoing work in existing dockets, the need for additional efforts related to wheeling of renewable energy to produce hydrogen would be mitigated. Requiring the Commission to implement any form of wheeling through rulemaking could not only delay the implementation but also create additional delays in the future when changes may be required to ensure that terms, conditions, prices, and other factors related to wheeling may need to change to reflect future system requirements and the Commission will have to go through rulemaking procedures again.

Thank you for the opportunity to testify on this bill.



**Written Statement of
David H. Molinaro
HCATT Manager
Hawaii Center for Advanced Transportation Technologies
before the
Committee on Commerce and Consumer Protection
Committee on Energy, Economic Development, and Tourism**

State Capitol, Conference Room 229
Tuesday February 13, 9:00 AM

In consideration of
SB2964

Chairs Keohokalole, DeCoite; Vice Chairs Fukunaga, Wakai and Members of the Committee.

The Hawaii Center for Advanced Transportation Technologies (HCATT) **supports** SB2964 authorizing independent generators of renewable energy to wheel the renewable energy transmitted and used to produce hydrogen, subject to certain conditions determined by the public utilities commission (PUC).

Permitting wheeling of renewable energy for use in the production of green hydrogen will help lower the cost of producing carbon-free green hydrogen. Under such a policy, entities will be more compelled to develop the capacity to generate electricity from renewable sources such as solar, wind, and geothermal. With PUC approval, this electricity will be allowed to be wheeled, through open access of the transmission grid, to the hydrogen production facility.

Allowing hydrogen electrolyzers access to inexpensive electricity unlocks the inherent flexibility of these systems. The economics of green hydrogen depend on three factors: capital costs, energy costs, and equipment utilization rates. The more often the electrolyzer accesses cheap electricity, the more price-responsive the electrolyzer can be, and the more it can produce hydrogen at a lower price.

This proposal will aid Hawaii in meeting its future energy needs, RPS mandates, and facilitate the development of green hydrogen and renewable energy industries. It will also reduce dependence on fossil fuels and cut greenhouse gas emissions.

Mahalo for the opportunity to provide this testimony.



Testimony to the Committee on and Energy, Economic Development and Tourism

Committee on Commerce and Consumer Protection

February 13, 2024, 9:00 AM

Conference Room 229 & Via Videoconference

SB 2964

Chairs, DeCoite, Keohokalole, Vice Chairs Wakai, Fukunaga and Members of the Committees,

Hawaii Clean Power Alliance (HCPA) **supports SB 2964**, which authorizes independent generators of renewable energy to wheel the renewable electricity they produce to users of renewable energy under administrative rules established by the Public Utilities Commission.

Hawaii Clean Power Alliance is a nonprofit alliance organized to advance and sustain the development of clean energy in Hawaii. Our goal is to support the state's policy goal of 100 percent renewable energy by 2045. We advocate for utility-scale renewable energy, which is critical to meeting the state's clean energy and carbon reduction goals.

The legislature recognizes that the state's progress to its clean energy goals is hindered by the continued use of imported fossil fuels and that zero emissions can be achieved by hydrogen. Additionally, it has become evident that clean energy projects are both short- and long-term economic drivers of jobs and new business development.

Renewable hydrogen can be made by renewable energy resources such as solar, wind or geothermal. However, the electricity to power an electrolyzer, best located at the site of the hydrogen user, must be transported.

Additionally, there are many renewable energy generating facilities that are curtailed when there is an oversupply of generation. This energy gets wasted and can be utilized to create hydrogen. This bill would solve the constraints.

We also recognize that the use of the utilities' transmission and distribution lines can be established fairly with PUC oversight to provide neutral impacts to the ratepayer and potentially create an opportunity for the utilities' to also improve their grid with additional revenue streams.

We ask the committee to pass this bill.

Statement of
Stanley J. Osserman Jr., President
Tigershark, LLC
Before the
Senate Committee on Commerce and Consumer Protection
AND
Senate Committee on Energy, Economic Development and Tourism
13 February 2024
9:00 am
State Capitol Conference Room #229
In consideration of
SB2964
Relating to Renewable Energy

Chair Keohokalole

Vice Chair Fukunaga and Distinguished Committee Members:

Chair DeCoite

Vice Chair Wakai and Distinguished Committee Members:

I stand in strong support of this bill.

As the former director of the Hawaii Center for Advanced Transportation Technologies (HCATT; 2013 to 2019), Hawaii Department of Business, Economic Development and Tourism (DBEDT), I continue to serve our state by promoting, among other things, clean renewable energy solutions. This testimony is NOT being given for compensation of any kind by any corporate or commercial entity. I am presenting to you today as a concerned “Life-Long” citizen of the State of Hawaii with extensive professional experience in energy systems, retail and wholesale business, military matters, international commerce, aviation, construction, maritime operations, and public safety, among others. My goal is to help our government leaders, local, state, and federal, make good strategic choices.

Hawaii has struggled to aggressively meet our Renewable Portfolio Standard (RFP). Finding innovative options to incentivize distributed generation options that help reach our goals is critical. One of the critical technologies that we will have to aggressively develop is the production of “Green Hydrogen” and this bill will assist greatly in that effort! Allowing private power producers to make clean and affordable hydrogen on site makes obtaining vital, reasonably priced, electrical power a priority. This bill will facilitate hydrogen production overall, but it will be particularly impactful for transportation use.

Hawaii is “Late to need” in moving away from fossil fuels to cleaner power generation options. Thanks for helping us catch up by including practical options to build and finance more private sector clean hydrogen!!!

Brigadier General, Stanley J. Osserman Jr. (USAF Ret.)

President, Tigershark, LLC



Testimony Before the Senate Committees on Commerce and Consumer Protection and
Energy, Economic Development and Tourism

By David Bissell
President and Chief Executive Officer
Kaua'i Island Utility Cooperative
4463 Pahe'e Street, Suite 1, Līhu'e, Hawai'i, 96766-2000

Tuesday, February 13, 2024; 9:00 am
Conference Room #229 & Videoconference

Senate Bill No. 2964 - RELATING TO RENEWABLE ENERGY

To the Honorable Chairs Jarrett Keohokalole and Lynn DeCoite; Vice Chairs Carol Fukunaga and Glenn Wakai,
and Members of the Committees:

Kaua'i Island Utility Cooperative (KIUC) is a not-for-profit utility providing electrical service to more than 34,000
commercial and residential members.

KIUC opposes this measure.

Over the past 10 years, KIUC has significantly increased its renewable generation. In 2010, KIUC's energy mix
included 10% renewable. Renewable production now stands at roughly 60%. This large growth in renewable
generation is not only well-ahead of established goals, it has significantly stabilized KIUC's rates: since May 2022,
KIUC has posted the lowest residential electricity rates in the state and is currently lower than rates recorded in
several localities on the mainland, such as San Diego.

Rate stabilization on Kaua'i is largely attributable to KIUC securing long-term power purchase agreements for
utility-scale renewable projects. Solar facilities and battery storage systems connected to utility-scale solar
facilities account for roughly two-thirds of our renewable production and are among our lowest priced energy
sources. We believe that utility-scale projects owned or contracted by KIUC best serve our members, as they
deliver electricity at prices that smaller, privately-owned projects could not achieve.

KIUC recognizes that developing hydrogen resources is valuable in our collective goal of reaching 100%
renewable by 2045. However, wheeling runs the risk of creating a "have" and "have not" system of energy
service where the majority would end up paying more in utility bills in the pursuit of this endeavor. KIUC
questions the need for wheeling on Kaua'i given the success of the cooperative in promoting and expanding
renewable energy production. If there are good, cost-effective renewable projects that KIUC is not pursuing, we
are always open to receiving developer proposals and if the project has merit, we believe the energy should be
made available to the full grid and all ratepayers, not just a few.

Franchised utility companies have a duty to serve all customers, the flip side is the utility needs to have the opportunity to serve all customers to avoid subsidization. We encourage a cautious and comprehensive approach to wheeling involving any non-franchise public utility operators. It is essential that any allowed wheeling include proper costing of services from the franchise utilities, which should include consideration of potentially stranded investments. KIUC also supports the preservation of the Public Utilities Commission's ability to disallow wheeling projects if they are detrimental to an electric utility or the public interest (i.e., other utility customers).

Mahalo for your consideration.



**Hawaiian
Electric**

**TESTIMONY BEFORE THE SENATE COMMITTEES ON
COMMERCE & CONSUMER PROTECTION
AND
ENERGY, ECONOMIC DEVELOPMENT, & TOURISM**

SB 2964

Relating to Renewable Energy

Tuesday, February 13, 2024

9:00 AM

State Capitol, Conference Room 229

James Abraham
Associate General Counsel
Hawaiian Electric

Dear Chair Keohokalole and Chair DeCoite, Vice Chair Fukunaga and Vice Chair Wakai,
and Members of the Committees,

My name is James Abraham and I am testifying on behalf of Hawaiian Electric offering comments on SB 2964, Relating to Renewable Energy.

Hawaiian Electric supports programs that aid renewable energy by enabling customers to use their renewable energy systems more effectively; however, the utility also recognizes the importance of equity and ensuring that the benefits of wheeling are balanced with any additional costs or burdens that may be placed on non-wheeling customers. Regulatory policies must take into account these considerations and establish policy and technical requirements that minimize cost shifting and consider the impacts on non-wheeling customers.

Hawaiian Electric agrees with the Public Utilities Commission's ("PUC") suggestion of opening a new investigatory docket to explore whether implementing wheeling in Hawaii is feasible and in the public interest. Specifically, we believe that such a docket should examine intragovernmental wheeling as an initial step to consider the appropriate

balance of interests and priorities and address among other things risk of potential significant cost and equity impacts to non-wheeling customers. Such a docket would allow the PUC, the Consumer Advocate, Hawaiian Electric and other stakeholders to establish a foundation for a balanced wheeling model which could be used to develop similar programs for a wider range of customer-participants.

In order to effectively balance many important objectives and produce sustainable success in Hawaii's unique renewable energy environment, a wheeling program must be designed to consider and address the following key principles:

- **Promote customer choice by increasing options.** We seek collaboration to establish and coordinate specific services between utilities and customers needed to lower bills, increase renewable energy, and energy efficiency.
- **Safety is paramount.** Operating an electric grid is complex and should be the responsibility of the utility without undue interference to ensure public safety and the safety of utility crews.
- **Reliability of the electric system.** The reliability and resilience of the public utility's electric grid must not be compromised.
- **Aiding renewable energy.** Wheeling programs should be designed and implemented to help increase the use of renewable energy for the benefit of the whole community, not just the few who can afford it.
- **Cohesion with existing renewable laws.** A new wheeling model in Hawaii must recognize existing laws, such as the utilities' 100% renewable portfolio standard, and ensure that wheeling does not interfere with or defeat these goals.
- **Equity.** Burden on other customers should be balanced with the benefits, including the opportunity cost for non-wheeling customers. Regulatory policies must minimize cost shifting, along with establishing other policy and technical requirements.
- **Avoid unintended consequences.** Hawaii's regulatory framework is sophisticated and intended to serve many state and customer objectives. In fostering achievement of certain objectives, care must be applied to avoid unintentionally undermining other priority objectives.

Hawaiian Electric has strong concerns about the feasibility of addressing and balancing the above key principles in a full retail wheeling model as proposed in this bill and believes that a reasonable first step would involve the PUC's examination of intragovernmental wheeling, which may have less impacts on non-participants and the community. Enabling full retail wheeling could potentially exacerbate financial and geographic equity issues by encouraging the construction of renewable energy projects on one part of the island to supply power exclusively to customers on another part of the island, using Hawaiian Electric's transmission and distribution system to connect them. Even assuming the Company is compensated for use of its infrastructure for the benefit of some customers, this arrangement could shift costs to customers who do not benefit from wheeling arrangements yet must still pay to maintain the grid. It could also aggravate community concerns that have emerged around the siting of renewable energy projects, especially if the benefits accrue only to end users located miles away. The PUC is currently investigating these and other energy equity issues in Docket No. 2022-0250, but the concepts being discussed in that proceeding do not include wheeling or the unregulated private energy producers who would be allowed to wheel under this bill.

We welcome continued discussion of how wheeling concepts can be adapted to fit the realities of the Hawaii energy system, with the understanding that the Company must play a primary role in structuring such wheeling transactions to ensure safety, reliability, and financial equity. Indeed, technology and the energy market have evolved to the point where Hawaiian Electric now enables customers to enjoy many of the benefits of wheeling through existing programs such as shared solar and the Microgrid Services Tariff. We must address the State's energy future as a whole and be cautious

not to simply adopt mainland solutions ill-fit for Hawaii, especially those used in larger grids with large manufacturing and commercial loads.

Hawaiian Electric appreciates the Committees' consideration of its comments on SB 2964. Thank you for this opportunity to testify.



Email: communications@ulupono.com

SENATE COMMITTEES ON ENERGY, ECONOMIC DEVELOPMENT, & TOURISM AND
COMMERCE AND CONSUMER PROTECTION
Tuesday, February 13, 2024 — 9:00 a.m.

Ulupono Initiative offers comments on SB 2964, Relating to Renewable Energy.

Dear Chair DeCoite, Chair Keohokalole, and Members of the Committees:

My name is Micah Munekata, and I am the Director of Government Affairs at Ulupono Initiative. We are a Hawai'i-focused impact investment firm that strives to improve the quality of life throughout the islands by helping our communities become more resilient and self-sufficient through locally produced food, renewable energy and clean transportation choices, and better management of freshwater resources.

Ulupono offers comments on SB 2964, which authorizes independent generators of renewable energy to wheel the renewable energy transmitted and used to produce hydrogen, subject to certain conditions determined the Public Utilities Commission.

While we applaud legislators' willingness to consider all possible solutions, Ulupono shares several concerns regarding the concept of electricity wheeling as it pertains to Hawai'i as an island state and its potential implications on our electricity markets, grid stability, and overall energy policy.

Private wheeling raises significant equity concerns, as it allows companies and other private entities to effectively buy up renewable energy projects (or the energy from such projects) that could otherwise, if purchased by the utility, benefit all ratepayers and the broader public interest.

In addition, Hawai'i's unique geographical and environmental characteristics present significant challenges for large-scale renewable energy projects necessary for hydrogen production. The islands have limited available land, much of which is of cultural, ecological and agricultural importance. Establishing large-scale renewable energy projects, which are necessary for generating the substantial amount of electricity required for electrolysis (the process of splitting water to produce hydrogen), would likely encounter significant land use conflicts. Looking into the near future, these conflicts could arise from competing needs for conservation, agriculture and urban development, leading to a potential imbalance in land resource allocation. Such conflicts are anticipated to increase as the

Investing in a Sustainable Hawai'i

need to balance these competing interests grow and intensify with each project that gets developed.

Furthermore, from the standpoints of energy efficiency and resource optimization, wheeling renewable energy for hydrogen production may not be the most prudent approach. The process of converting electricity into hydrogen and then back into usable energy is inherently less efficient than using electricity directly to power vehicles and industries. The energy losses in electrolysis, hydrogen storage, transportation, and reconversion to electricity in fuel cells indicate that—with currently available technology—the direct use of renewable electricity is a more efficient and effective way to meet Hawai'i's energy needs, particularly in a land- and resource-constrained context. Using renewable energy to create hydrogen could possibly make economic sense where abundant renewable energy is being produced *in excess* of our collective electricity/energy demand. In such a situation, excess energy would be priced extremely low, thereby making the inherent inefficiencies associated with the production of hydrogen less of a concern. It is possible that Hawai'i will someday leverage its abundant natural resources in such a way as to make the production of clean hydrogen possible, but presently—without an economic case for it—wheeling renewable energy to make hydrogen is difficult to justify.

In conclusion, while the pursuit of sustainable and renewable energy sources, including hydrogen, is vital for Hawai'i's energy future, the specific approach of wheeling renewable energy for hydrogen production in Hawai'i's land-constrained context raises significant concerns. It is imperative that we consider the unique characteristics of Hawai'i and explore energy solutions that are environmentally sustainable, economically viable, culturally respectful, and socially inclusive.

Thank you for the opportunity to testify.

Respectfully,

Micah Munekata
Director of Government Affairs