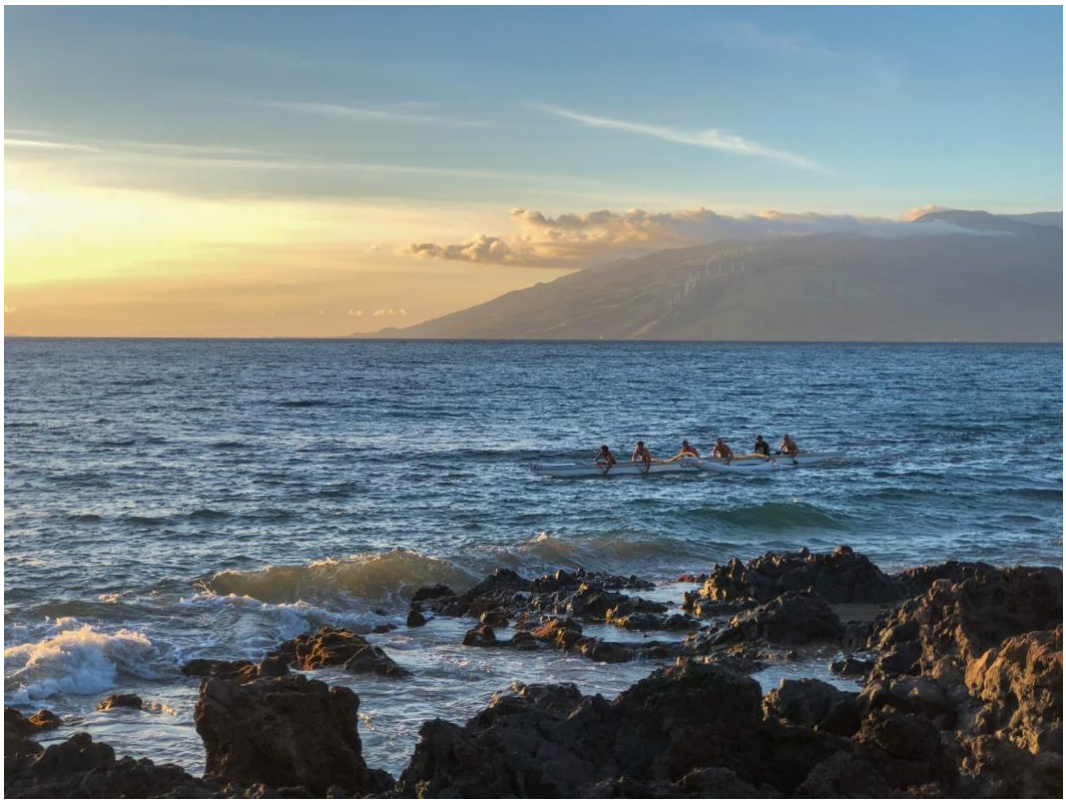

HAWAIʻI STATE ENERGY OFFICE

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APPENDIX A

Decarbonization Report: Synthesis of Outreach and Engagement

Appendix A-1: Facilitated Stakeholder Meetings

Executive Summary

In November 2023, the Hawai'i State Energy Office (HSEO) conducted four targeted meetings with 59 participants[1] and 111 distinct invitees from across government, nonprofit, and private sectors to discuss the state's Decarbonization Report. The four meetings were facilitated by Hua Nani Partners and held on the topics of *Equity*, *Land Use and Transportation for O'ahu*, *Land Use and Transportation for Neighbor Islands*, and *Decarbonization Tradeoffs*. HSEO sought feedback on the draft modeled decarbonization scenarios and prioritization of draft recommended measures. All meetings were offered in a hybrid in-person and virtual format to increase the opportunity for participation, except for the *Land Use and Transportation for Neighbor Islands* session, which was entirely virtual. This document summarizes the feedback received in the four convenings.

These convenings were a part of HSEO's stakeholder engagement process to collect input on the Decarbonization Report, which included the following:

- HSEO Decarbonization website launched on December 2, 2022, with open public comment form from June 2023 to November 17, 2023 (responses included in Appendix A-2)
- Individual stakeholder discussions with HSEO from June 2023 – December 2023; over twenty-five (25) meetings and five letters received (included in Appendix A-4)
- Thirteen combined meetings with sector-specific Priority Climate Action Plan (PCAP) groups June 2023 to October 2023
- Four (4) targeted convenings (working groups) with 59 distinct participants focused on Equity, Land Use and Transportation, Decarbonization Tradeoffs (feedback summarized in Appendix A-1).
- Two (2) public webinars with 100+ distinct participants total (over 200 invitees) on September 12, 2023, and November 14, 2023, including a separate feedback form at the November 14 webinar (responses included in Appendix A-3)
- Presentation to the Hawai'i Energy Equity Hui (EEH) on July 7, 2023. The EEH, established in 2020, is a statewide public-private collaborative network of individuals and organizations working towards an equitable clean energy transition.
- Presentation to Hawai'i Pacific University students on October 19, 2023.

HSEO also conducted an educational briefing on the modeled decarbonization pathways and draft report recommendations with a group of legislators and staffers representing nine legislators' offices in advance of finalizing this report.

Common Themes: Build on Existing Solutions and Incorporate Innovation, Equity, Education

While each of the stakeholder meetings had a different topical focus, certain common themes emerged across all sessions. Participants from all four meetings emphasized the need to incorporate equity more ambitiously in

[1] Participant totals from each stakeholder meeting do not add up to 59 as multiple individuals attended more than one meeting.

both substance and process, to use the extensive existing work that has been done by Hawai‘i communities and agencies, and to build upon these for future action, partnered with innovation. Participants also emphasized the need to build trust with communities to help them understand the incentives, challenges, and inevitable tradeoffs that come with the proposed Decarbonization Report. This section outlines the overall recommendations and identified challenges that emerged from these convenings.

Main Recommendations

Maximize existing solutions while also pursuing new opportunities. Most of the proven, effective decarbonization solutions need to be implemented for Hawai‘i to be successful in achieving its decarbonization goals. We no longer have the luxury of time to select just a handful of solutions to reach our emissions reduction targets. It is critical that measures are carried out and sequenced correctly to not further burden low-income or asset-limited, income-constrained, employed (ALICE) households–in other words, most of Hawai‘i’s local working families.

Education and community engagement are essential to successful decarbonization. The importance of building community trust cannot be overstated. Behavioral change will inevitably be a part of successful decarbonization, and while financial incentives play a role in affecting human choice, people are also driven by trusted messengers, alignment with personal values, day-to-day priorities, and more. Equitably driving behavioral change will require fundamentally reworking relationships with communities – both by the government and the private sector. Further, regulatory requirements need to be simplified to include expeditious and meaningful community involvement at all points of project development. As government agencies and project developers turn to community members for input, it is important to address that stakeholder engagement fatigue is a growing issue. As a collective of public and private entities, we should implement creative solutions, combine outreach efforts, and appropriately compensate community members for their time.

Hawaiian Indigenous knowledge should help guide our energy transition. Hawaiian ancestral and Indigenous knowledge should play a critical role in our pathway to net negative emissions. Consider innovation in the context of Indigenous solutions, revitalizing the ahupua‘a land management system, and centering Native Hawaiian voices.

Main Challenges and Potential Solutions

Participants repeatedly identified various challenges to implementing decarbonization solutions at scale to reach the state’s emissions goals. The barriers are detailed below, each paired with potential solutions proposed or discussed by participants.

Lack of consistent and timely funding. Even with the influx of federal funding, one of the biggest barriers is the capital needed to implement clean energy and transportation projects at the speed and scale required for the energy transition, combined with the one-time nature of most of these funds.

- *Potential Solutions:* Implement new or reimagined sources of revenue that are more sustainable, such as a “polluter pays” or “feebate” structure, or consider redirecting existing sources of funds such as the

barrel tax. State and local agencies should also coordinate more closely on applying for federal funding and leveraging these with existing funds.

Labor and resource constraints. Hawai‘i’s current workforce and available resources are severely deficient for the successful implementation of projects required to reach decarbonization targets.

- *Potential Solutions:* Encourage investment in Hawai‘i’s local workforce by using federal funds to partner with local universities in developing a workforce that is trained to perform jobs necessary for the energy transition, as well as to administer, implement, and monitor these funds. Support gathering of data to better understand decarbonization careers in Hawai‘i.

Regulatory and statutory policy inflexibility at state and local levels. These issues range from the inflexibility of the regulatory/statutory system to keep up with technology, stemming from programs rigidly defined in statute, to project permits that take months or even years to be approved.

- *Potential Solutions:* Law-making, regulatory, and policymaking bodies should make a greater effort to incorporate flexibility into law, rulemaking, and policies to make space for emerging and evolving technologies and shifting market environments. Ensure regulatory bodies are adequately staffed to address these ongoing issues.

Community opposition to decarbonization projects. Participants expressed that there is already existing community opposition to decarbonization projects, for a wide variety of reasons, including historical lack of extensive community engagement by project developers, negative project impacts, and more. This opposition is likely to continue if communities are not appropriately and robustly engaged by the public and private sectors on this strategy and its associated measures.

- *Potential Solutions:* Recognize and openly discuss the tradeoffs, provide education and information transparently and in a timely fashion, and actively provide incentives to decarbonize (such as financing rooftop solar for low-income households and providing incentives for public transit, biking, and other modes of transportation). Require a certain level of meaningful community engagement for all state- and county-led projects, along with utility-scale energy projects. Consider community benefits packages as a tool to reconcile opposition and concern around new projects, with the stipulation that benefits should be designed mindfully and for longevity.

Risk of overburdening residents during the energy transition. The inevitable burdens of decarbonization (costs, behavioral changes, etc.) tend to fall disproportionately on residents who already bear the brunt of unaffordable costs of living partly because of the visitor industry.

- *Potential Solutions:* Hawai‘i needs to ensure the visitor sector is included and equitably addressed in the state’s plan to decarbonize. For example, the State can consider strategies such as vehicle miles traveled (VMT) reduction specifically targeted to visitors, along with redirecting the rental car surcharge to fund decarbonization measures.

Meeting Summaries

The following summarizes the discussions from each of the four meetings. Although each of the meetings was structured in a slightly different way, HSEO covered the background and context of Act 238, the existing policies and work completed to date, a high level review of the four modeled decarbonization scenarios, and the resulting critical pathways to decarbonization.

Equity

HSEO hosted the stakeholder meeting on *Equity* on Monday, November 6, 2023, 1:00 pm - 3:30 pm HST, with a total of 24 meeting participants[2]. This group discussed four of the pathways to decarbonization:

1. 100% reduction in fossil fuel combustion,
2. Improved efficiency & demand response technology adoption,
3. 20% reduction in statewide VMT, and
4. 100% zero-emission vehicle (ZEV) sales by 2035, and the equity challenges and opportunities associated with each pathway.

The following themes emerged from the *Equity* meeting.

Reshape the system to prioritize benefits for low-income individuals. A system for sharing benefits, community ownership models, and different business models needs to be developed. However, innovation is not the biggest need—implementation is, such as using tax credits from the Inflation Reduction Act for low-income families.

Rebuild trust with communities. Communities have felt they haven't been heard by government agencies and developers. In addition, there is a need for more transparency from the beginning to the end for energy projects and programs. Getting the appropriate information out to the wider community is both a challenge and an opportunity to pursue.

Community-level and culturally-appropriate responses in the transition are essential. The uniqueness of individual communities needs to be considered. Emphasis needs to be placed on education along with trusted partnerships and relationships. There is importance in building trust between communities and the government. To this end, the stakeholders would like to be kept posted on legislative packages proposed by HSEO to deal with these issues.

A holistic energy response is needed. There is a strong need for an integrated plan, as efficiency is not the whole solution for zero. For example, rooftop solar and demand response go together and are not an either-or situation.

[2] This attendee count does not include HSEO staff or facilitators from Hua Nani Partners present at the meeting.

The transportation discussion emphasized Hawai'i's rural/urban needs, particularly for lower-income communities. On the ZEV side, several issues were discussed: equity for medium- and heavy-duty vehicle drivers and lack of EV charging for rural communities and the general population. On the VMT reduction side, the discussion centered around the need for reliable public transportation, that jobs need to be located close to home, along with the need for protected bike lanes, complete streets, and the development of active transportation networks. Participants also discussed the visitor industry's impact on transportation.

Land Use and Transportation for Neighbor Islands

HSEO hosted the virtual stakeholder meeting on *Land Use and Transportation for Neighbor Islands* on Monday, November 13, 2023, 9:00 am - 11:30 am HST, with a total of 16 meeting participants. This group focused on the two transportation-focused decarbonization pathways, a 20% reduction in statewide VMT, and 100% ZEV sales by 2035, focusing on priority recommendations for each pathway and challenges associated with implementation. Participants discussed challenges to implementing existing policies, and how to build on work that has already been done in this space. The following themes emerged from the discussion.

There are challenges surrounding status quo development, funding, alignment, and enforcement of state goals. Participants outlined several challenges such as:

- The funding needs are great, even with the new federal monies. The need to collaborate for these federal funds is essential. Particularly, long-term financing strategies are needed to fund infrastructure and staff beyond the federal dollars.
- State agencies have entrenched interests–such as revenue from rental car fees–that conflict with unenforceable climate goals. The status quo for development patterns is difficult to surmount.
- Limited expertise in multimodal transportation engineering is also a challenge, as this contributes to the inadequate progress made on transportation goals and in upholding the inequitable status quo.

The State should play a bigger role in support of counties for Transit-Oriented Development (TOD) and Complete Streets. Participants agreed that the State can play a larger role in encouraging and supporting counties to strengthen Complete Streets and Transit-Oriented Development. Counties should be included in the land use scenario discussion because they face different land use issues, and there is a dire need for alignment of county and state zoning to help develop more mixed-use developments and commercial nodes to address VMT increases.

Equity in transportation must be addressed. Even though equity was not the focus of this group, it was discussed as being crucial to the transition. The current transportation system is inequitable and providing more travel choices, rather than being punitive to drivers, will help reduce this inequity. The strategies to reduce such inequity are reflected in VMT reduction accompanied by an increase in transportation choices–through TOD, Complete Streets, and related topics discussed by the hui, such as visitor-related transportation needs.

It's critical to draw from existing work done thus far, particularly for VMT reduction. The group recognized that significant work has been done on the transportation issue of VMT reduction and encouraged the use of reports and their findings thus far, such as establishing a VMT goal, to move towards implementation.

Land Use and Transportation for O‘ahu

HSEO hosted the stakeholder meeting on *Land Use and Transportation for O‘ahu* on Thursday, November 16, 2023, 1:00 pm - 3:30 pm HST, with a total of 11 meeting participants. HSEO incorporated feedback from the earlier *Land Use and Transportation for Neighbor Islands* session and tailored this meeting to discuss and prioritize top-line recommendations from existing reports[3], and what is needed to implement known policy recommendations. Like the other Land Use and Transportation meeting, the discussion focused on the two transportation pathways, namely a 20% reduction in statewide VMT and 100% ZEV sales by 2035.

The group discussed challenges for transportation decarbonization including capital constraints (labor, dollars, resources) and the difficulty in establishing VMT goals, given there is no single entity that regulates VMT, unlike the renewable portfolio standard which is regulated by the utility. The group also discussed potential strategies for transportation decarbonization, including increasing revenue for the clean transportation transition through the barrel tax, and recognizing through policy that there should be a directional change in VMT even if a specific reduction is not articulated. Participants also emphasized the need to strengthen Complete Streets strategies (and overcoming obstacles such as permitting). HSEO presented the group with eight priority recommendations for VMT reduction and ZEV adoption based on existing reports and work done thus far, asking participants to rank actions for the state to prioritize in the next 1-3 years.

Participants ranked the following eight actions to be prioritized in the next 1-3 years to reach a 20% reduction in statewide VMT:

1. Encourage complete streets, infill development, and land-use mixing
2. Prioritize investments in public transit
3. Require evaluation of land use and VMT impacts for all state and county projects (e.g. capital improvement projects & new housing developments)
4. Prioritize development, improvement, and maintenance of active transportation infrastructure
5. Parking reform (e.g., increased parking costs, bike parking)
6. Adopt a statewide VMT reduction target for LDVs
7. Commuter benefits and incentivizing telework
8. Implement an aggressive road usage surcharge

There was a lengthy discussion on setting a statewide VMT target through legislation; some participants voiced it’s not worth the time and resources to pass such a bill at the legislature, and others advocated for the importance of measuring progress towards an established goal. The group also explained the low ranking of an

[3] The reports taken into consideration for this discussion were *Estimating Policy Effects on Reduced Vehicle Travel in Hawai‘i* (SSTI, Smart Growth America, and Rhodium Group for Transcending Oil, 2019); *ICCT Hawai‘i Clean Energy Initiative Transportation Energy Analysis* (HSEO, 2015); *Roadway Expansion and Vehicles Miles Traveled Report* (RMI for Hawai‘i Climate Commission, 2022; *Investing in Transportation Choices: Recommendations for Safe, Sustainable, Affordable and Reliable Mobility* (Hawai‘i Climate Commission, 2023); and *Drivers of VMT and Priority Reduction Strategies* (SSTI and Smart Growth America for the Hawai‘i Climate Commission, 2021).

aggressive road usage surcharge by highlighting the need to implement other VMT reduction strategies first to provide individuals with options for alternative modes of transportation before placing a fee on driving.

Participants ranked the following eight actions to be prioritized in the next 1-3 years to achieve 100% ZEV sales by 2035:

1. State investment in EV charging infrastructure
2. Conversion of county and rental fleets[4]
3. Update HRS §291-71 to require more charging stations for larger lots, and decrease the minimum parking threshold of 100 vehicles (e.g. require 1 station per 50 stalls)
4. State-issued rebates for EVs
5. Establish a program to ensure charging stations that received public funding, or are mandated per HRS §291-71, are maintained and operational
6. Expand rebates for e-bikes
7. Light duty vehicle buyback program ("cash for clunkers"), potentially focused on low-income groups
8. Fuel switching for medium- and heavy-duty vehicles

Although not included in the original list of measures to rank, participants advocated for the inclusion of EV-ready new construction in the list of priority actions.

Decarbonization Tradeoffs

HSEO hosted the stakeholder meeting on *Decarbonization Tradeoffs* on Friday, November 17, 9:00 am-11:30 am HST, with a total of 20 meeting participants. The group discussed tradeoffs associated with behavioral change – one of the most cost-effective mechanisms to achieve decarbonization – and effective land use. The themes across discussions from the Decarbonization Tradeoffs session reflected the need for a holistic approach to addressing decarbonization challenges, emphasizing the interconnectedness of emission reduction goals, equity considerations, renewable energy strategies, community engagement, and the role of government in creating a supportive regulatory environment. The following specific themes emerged from the discussions.

Engage in meaningful stakeholder engagement and relationship building. The group emphasized the importance of procedural equity in addition to equitable outcomes and operationalizing trust-building without extending project timelines. The group also discussed ways to ensure that projects benefit communities and promote equity, including considering community benefits packages and their role in fostering positive relationships between projects and communities. In cases where community opposition is overwhelming, economic benefits are no enough to warrant projects being approved and developed.

Consider bold and creative solutions. The group discussed creative decarbonization solutions such as shutting down roads or freeways for periods of time; conducting sweeping education campaigns, such as on energy efficiency measures; community ownership of projects; etc.; and innovative tools such as Hawai‘i Green Growth’s Mālama Implementation Tool–a place-based project assessment tool.

[4] State vehicles are mandated to be 100% ZEV for LDVs by 2045 (HRS §103D-412 and HRS §196-9).

Behavioral change driven by education, limited by economic factors. The group discussed the importance of achieving behavioral change equitably, particularly in the transition to EVs, and considering the role of education in driving equitable behavioral change. With limited time, there is a higher risk of behavioral change being inequitable. For many struggling families in Hawai‘i, money limitations are a reality, and cheaper solutions that save them money are realistically more appealing.

Government working as a partner without getting in the way. Participants expressed that the legislature could do more to encourage more efficient public-private partnerships by not being too prescriptive with policy, but using it to encourage the use of existing tools. We can look at our past successes (i.e. adoption of rooftop solar largely due to the confluence of federal and state tax credits that spurred commercial boom), and attempt to replicate those conditions. Modeling this success will be more difficult for transportation, as it's inherently a less regulated sector with over one million individual actors. The government does, however, play a primary role in the infrastructure creation, maintenance, and alteration for transportation networks.

Conclusion

Participants across all four sessions voiced the critical nature of equitable process and outcomes, incorporating robust community engagement strategies, strengthening public-private partnerships, improving supportive regulatory environments for expedited project planning and implementation, and maximizing both proven and innovative solutions to successfully reach the State's decarbonization goals.

According to meeting participants, some of the greatest barriers to the State's successful, equitable decarbonization are largely the inverse of these tenets: lack of financial, workforce, and resource capital; community opposition; risk of overburdening communities which are already struggling; and policy inflexibility. The feedback from these four meetings shaped this report and its associated recommendations.

Appendix A-2: General Online Survey Responses

The following is a record of online survey responses received from June through November 2023. A total of 18 individuals completed the form. HSEO asked the following questions in the survey:

- Given the thirteen requirements of Act 238, what should be a primary focus of the Decarbonization Strategy?
- What are your biggest concerns regarding climate mitigation actions?
- Are there outstanding questions that the Decarbonization Strategy should answer?
- What are the most important components of climate pollutant mitigation?
- What are the biggest barriers to meaningful climate pollution reduction?
- Additional Comments: Please feel free to include comments on scenario assumptions and past presentations here.

Responses are included below grouped by these questions. Respondents did not have to answer every question. Comments are attributed anonymously, to an organization, or to an individual, depending on the respondent's indicated preference. These responses have only been altered to correct spelling and grammatical errors, and are otherwise the verbatim responses received from the form.

Given the thirteen requirements of Act 238, what should be a primary focus of the Decarbonization Strategy?

Anonymous Respondent: #3. Include land use and transportation planning measures aimed at reducing emissions from the transportation sector

Anonymous Respondent: #8, 10 & 12. Environmental Justice - how this affects people, especially some of the hardest hit who often have minimal resources to respond. And understanding where the major impacts are and what actions can be taken to make informed decisions.

Anonymous Respondent: Include land use and transportation planning measures aimed at reducing emissions from the transportation sector. Our small state has been built on a car centric model. Improvements to walkability, bicycling infrastructure and micro mobility, followed by public transit, should be prioritized over personal auto use.

Anonymous Respondent: Getting people out of cars and onto clean transport means.

Anonymous Respondent: The examination of contributions from each carbon emitting source, how each source can be reduced, and entities responsible for reduction is the most important requirement of ACT 238.

Anonymous Respondent: I'm not sure I know which requirements these are and it wasn't really listed that way in the PPT.

Anonymous Respondent: Mitigation

Anonymous Respondent: Implement Ocean Thermal Energy Conversion (OTEC) technology on a commercial scale.

Anonymous Respondent: Transportation

Anonymous Respondent: Fast tracking progress in the sectors with the highest emissions: electricity and transportation.

Sustainable Energy Hawaii: Long term systems' sustainability and energy transition capacity, modeling competitive supply-chain conditions, geopolitics and resulting affordability for economic stability while keeping appropriately ahead of the curve with corresponding global decarbonization efforts. This means focusing on baseload systems that are less reliant on CRM than intermittent systems, have better capacity factors and a more environmentally supportive footprint.

Sean Newsum, Airlines for America: Airlines for America® (A4A), the principal trade and service organization of the U.S. airline industry, appreciates the opportunity to provide input into the Hawaii State Energy Office's (HSEO) Act 238 Decarbonization Study. We applaud the State of Hawaii's leadership in establishing long term economy-wide decarbonization targets and conducting analysis on the viability of various decarbonization pathways. We appreciate the HSEO's efforts to share an overview of its proposed approach to the decarbonization analysis, the assumptions therein, the embedded decarbonization sectoral targets, and solicit feedback from the community.

Within Requirement 9 of the Decarbonization Strategy, which specifies to determine the most cost-effective pathway, and Requirement 10 which specifies to rank recommendations based on level of impact, cost and east of implementation, we recommend to ensure 'economic impact' is incorporated in the analysis of these requirements and the list of scenario evaluation criteria. For example, policies aimed at air traffic demand reduction, and thus visitor demand reduction, would likely have a negative impact on the economic activity of the state and those impacts should be considered in the evaluation.

The initial Decarbonization Strategy for aviation focuses on state actions to encourage electrification and adoption of alternative fuels. And further, to determine the most cost-effective pathways to decarbonization. Sustainable Aviation Fuel (SAF) is the most cost-effective pathway to decarbonization for aviation, and state actions in the form of incentive policies to accelerate the availability of affordable SAF for air transport service providers serving Hawai'i are the most critical action in meeting the objectives of the Decarbonization Strategy.

Joe Kent (Grassroot Institute of Hawaii): 11. Make recommendations on whether the goals established pursuant to HRS §225P-5 should be adjusted. The current goals are not practically achievable without increasing costs beyond what residents can sustain.

Leah Laramee (Hawai'i State Climate Change Mitigation and Adaptation Commission): Holistic and multi beneficial actions such as nature-based solutions mixed use community building. Reducing VMT and solutions that reduce the cost of living in the state.

Jayne LeFors (Individual): The primary focus should be transitioning away from a tourism-based economy and towards a self-sustaining economy that provides the majority of our food resources within the state. We can't ignore the fact that every year millions of people travel here by jets that

spew tons of CO2 into the atmosphere. We also need to reduce the amount of goods, mainly food, that must be sent here by ships and planes that emit tons of CO2. Food security and food production should be high on the list of priorities for our state.

What are your biggest concerns regarding climate mitigation actions?

Anonymous Respondent: GHG emissions is a global pollutant.

Anonymous Respondent: This is a new set of challenges. How do we pilot ideas and try new things in a way that allows for failure, and accelerates successes?

Anonymous Respondent: Focus on a big shiny "thing" to solve our problems, unless the citizens have the appetite for nuclear power, we're going to need to distribute our efforts AND make some people unhappy. Lightweight electric vehicles and public transit over internal combustion vehicles. smaller, possibly slower roadways, people over cars, housing density, better zoning... There is very little political will to be forward looking.

Anonymous Respondent: It will involve radical shifts in the economy and people will resist.

Anonymous Respondent: The state is not doing enough to prepare for sea level rise and expected increased storm activity. 1)The inundation of our installed water distribution and sewage collection system by rising ground water will make it extremely difficult to repair water main breaks and will cause greater infiltration into our sewage collection pipes which will increase sewage treatment quantities. 2)Coastal roadways (Kaʻaʻawa, Hauʻula and Sunset Beach area) need to be moved inland now. 3) We need hurricane hardened state and county buildings where those without shelter or in substandard shelters (the majority of Oahu!) can seek refuge during a strong hurricane (Cat 3 or larger).

*Anonymous Respondent: T*hat we are going to rely on technology adoption versus technologies that exist now but require resources (like building sidewalks, or energy efficiency).

Anonymous Respondent: They are done in a rigid manner that does not allow State to adopt to new technologies and challenges.

Anonymous Respondent: A lack of public willingness to spend the money required.

Anonymous Respondent: Not having the workforce to implement. Public opposition – e.g. so hard to build a pedestrian bridge or bike lanes

Anonymous Respondent: We talk more than we implement. We don't do what we say. We are always looking for magic options that don't exist.

Sustainable Energy Hawaii: That the rest of the world is not doing their part. Hawaii may not be balancing local economic stability with energy system resilience while giving emissions the dominant say in action choices.

Sean Newsum (Airlines for America): The Decarbonization Strategy can only be met through a strong public-private partnership between the government and aviation stakeholders, including airlines, but also, critically including fuel producers. Hawai'i state government has a critical role to play in incentivizing and supporting the availability of affordable SAF from fuel producers.

A4A and our members are committed to limiting and further reducing our industry's greenhouse gas ("GHG") emissions. On March 30, 2021, A4A, together with our member carriers, pledged to work across the aviation industry and with government leaders in a positive partnership to achieve net-zero carbon emissions by 2050 ("2050 NZC Goal"). This pledge continues our longstanding commitment to embrace our responsibility to address climate change and reduce commercial aviation's GHG emissions footprint. Our 2050 NZC Goal parallels the Administration's goal of achieving net-zero GHG emissions in the aviation sector by 2050, included in its Aviation Climate Action Plan announced November 9, 2021 ("Aviation CAP").

The U.S. airline industry and the Administration also share the conviction that SAF will be critical to meeting our ambitious climate goals. The Administration's Aviation CAP agrees with every credible analysis in concluding that SAF "will be critical to the long-term decarbonization of aviation" and "to aviation's ability to meet the net-zero goal." This is the core impetus for the Administration's policy – manifested in the SAF Grand Challenge – to make 3 billion gallons of cost-competitive SAF available to U.S. aircraft operators in 2030. On September 9, 2021, in harmony with the Biden Administration's announcement of the SAF Grand Challenge, A4A and our members increased the previous 2 billion gallon A4A SAF goal by an additional 50 percent, establishing the 2030 SAF Goal.

In addition to sharing these goals, the Administration and the government are united in the view that they can only be met through a strong public-private partnership between the government and aviation stakeholders, including airlines. As summarized in its Aviation CAP, the USG has committed to working through a range of policy instruments, including the SAF Grand Challenge with industry to rapidly scale up SAF production with the goal of meeting the fuel needs of U.S. aviation by 2050." Similarly, A4A has welcomed its "whole of government approach" and committed to working in partnership with government to meet its 2050 NZC Goal and 2030 SAF Goal.

A4A and our members are proud of our strong environmental record. We have been keenly focused on fuel efficiency and GHG emissions savings for many years. As a result, U.S. airlines have improved their fuel efficiency over 135 percent between 1978 and 2021, saving over 5.5 billion metric tons of carbon dioxide (CO2), which is equivalent to taking more than 28 million cars off the road every year for 40 years. Our industry supports more than 10 million jobs nationally and 5 percent of GDP while contributing just 2 percent of our nation's GHG emissions (ref. U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020). This record is not happenstance but the result of our long standing, strong commitment to addressing climate change. For the past several decades, U.S. airlines have dramatically improved fuel efficiency and reduced GHG emissions by investing billions in fuel-saving aircraft and engines, innovative technologies like winglets (which improve aerodynamics) and cutting-edge route-optimization software. These investments have backed ambitious climate commitments. Since 2009, we have been active participants in a global aviation coalition committed to achieving ambitious climate goals. Today, we are focused on making the investments necessary to achieve our 2050 NZC Goal and 2030 SAF Goal.

Joe Kent (Grassroot Institute of Hawaii): 1. Most of the projected progress seems to rely on switching to sustainable aviation fuel (SAF) which currently costs more than two times the price of U.S. jet fuel, and that could significantly increase the price of air travel.

2. There may be lots of public pushback if lawmakers attempt to achieve a rapid reduction in nearly all gasoline cars.

3. Hawaii is not an ideal place to switch its entire fleet of EV cars because of the end-of-life cycle issues with lithium batteries, which are costly, difficult and hazardous to ship.

4. Reducing vehicle miles traveled is not an equitable policy, since those on lower incomes may need to travel more in order to get to work.

5. Limiting flights to Hawaii would hurt our tourism industry, which is the primary driver of our economy.

6. It would be extremely difficult to build solar on all the ideal places on Oahu, and even doing so wouldn't be enough to power the island.

7. Solar farms compete somewhat with agricultural farms, which presumably would be needed to "sink" carbon.

8. Materials for green energy may rise in price significantly as more government mandates around the world increase demand for EVs and biofuels. So the switch to cleaner energy could be even more expensive in the future.

9. HECO's grid plan is projected to cost billions of dollars, and with lawsuits on top of that, the electricity costs for ratepayers will likely rise, even under the reference scenario.

10. HECO's grid plan lists biofuels as its main source of firm power, which are twice as expensive as oil.

Leah Laramee (Hawai‘i State Climate Change Mitigation and Adaptation Commission): That we are behind schedule! more funding needs to be dedicated to comprehensive and cohesive actions.

Jayne LeFors (Individual): I’m concerned we’re doing too little too late. We need to ramp up solar production on every rooftop, both residential and commercial structures. We need to build solar structures over every parking lot. This is being stifled by HECO as they drag their feet by reducing incentives and making the buyback period increase. We also need hundreds more EV charging stations built across the state as soon as possible. Look to California for their example - when I visit there I see every parking lot has row upon row of charging stations, while here in Hawaii you might see just one or two chargers in major shopping centers.

Are there outstanding questions that the Decarbonization Strategy should answer?

Anonymous Respondent: How and who? What are the obligations and how will can the state support businesses and individuals to make the necessary changes. The Green Bonds program is a great example from the EU, that has motivated companies to perform better and come up with creative solutions so that they can access lower cost funding.

Anonymous Respondent: What is the commitment to supporting the best options available " today"? Affordable carbon capture and storage will always be 15 years away, we can't wait. Are we really going to pay for carbon capture at the point of production, higher electricity rates are not going to fly with the electrification of everything, we cannot allow this plan to be a boondoggle for HECO!

Anonymous Respondent: How can the economics of each high-impact measure be restructured to pay for itself?

Anonymous Respondent: The pathways to reduce statewide carbon emissions from vehicles, trucks, buses and airplanes is my major concern for reducing carbon emission in Hawaii. With regard to private vehicles it appears we are going the wrong way, as the number of large gasoline consuming trucks and SUV's on our roads today compared to the early 1990's is much greater. How can the State or County governments most effectively influence the general population and specific businesses to move to more energy efficient transportation alternatives?

Anonymous Respondent: It should way the costs of decarbonization against the benefits. There is very little upside to carbonization given Hawaii's size if other jurisdiction do not also join in.

Anonymous Respondent: Since OTEC technology was proven in the 1970's and 1980's, what more is needed to bring it to commercial reality?

Sustainable Energy Hawaii: How is public policy encouraging a development environment through a critical analysis of current regulatory hurdles that currently discourage the level of investment needed to transition the broader energy system to include the replacement of liquid transportation fuels

Stephanie Chang (Stephanie Chang Design Ink): In all of this valuable modeling and scenario building, I encourage you to be honest about the role of people, of human choice in all of this. Community residents choosing to adopt energy efficient appliances, community residents choosing to purchase an EV, community residents choosing a renewable energy project to be built and sited in their communities, and others including the need for community residents to decrease consumption and waste etc. etc.

Can we quantify the role of this individual choice by residents within the big picture of decarbonization? How will people choosing to do (or not do) the above actions affect total Greenhouse gases for Hawaii? We should be asking this; it is an important aspect of the equation, no? If the report is capturing what is needed for Hawai‘i to successfully decarbonize, the report needs to acknowledge the role of people’s actions as it will affect decarbonization. Even if it cannot be quantified, it can still be acknowledged, and I would argue, centered. It matters in the report to acknowledge it, and even more ideal if quantified because it helps all of us understand its degree of importance. We know the tools to influence behavior — effective storytelling, engagement, outreach, education — but HOW important are they??? Please help us understand. That this figures in your

report also matters because it signals where organizations' and agencies' focus should go. It allows organizations' funding allocation to match the degree to which this aspect affects our state's goals.

There are many things that drive human choice. Yes, offering financial incentives is one piece (as could be regulatory aspects) but it is not the only driver. Feeling trust for the messenger is a part of it; feeling like one understands the Why. Feeling like this choice also aligns with our personal values is another. Decarbonization may see most effective result if it's aligned and connected with what communities care about and are asking for: ability to contribute and shape infrastructure (social and physical) to reflect their values. All of these things require a degree of intention and effort to carry out. It will not happen "on its own" naturally and without investment; it will not happen with business as usual.

Sean Newsum (Airlines for America): How can Hawai'i government best contribute to enabling SAF availability from fuel producers for flights serving Hawai'i?

A4A and our members strongly support tax incentives – in particular the US federal government SAF Blenders Tax Credit (BTC) – needed to catalyze SAF production. The Biden Administration also strongly advocated for the enactment of these incentives and we are thankful for the critical support the Administration provided to ensure enactment of the SAF-BTC and Clean Fuels Production Credit (CFPC) – as well as other tax incentives like the Clean Hydrogen Credit – that will provide support vital to successfully engendering exponential growth in domestic SAF production through 2030.

While the national SAF Grand Challenge will provide necessary support to the Hawai'i decarbonization strategy, to fully achieve the strategic objective defined by HSEO for cost-effective decarbonization pathways, state level policies for Hawaii that complement federal incentives must be adopted. Illinois, Minnesota, and Washington have each adopted producer or purchaser tax credits within the past year to encourage the adoption of SAF in their states. We encourage the State of Hawaii to consider a similar approach.

Joe Kent (Grassroot Institute of Hawaii): By what means is the state assumed to achieve significant reductions projected in each scenario?

Jayne LeFors (Individual): How can we create a Green Economy that doesn't depend on tourism and instead promotes self-sustainability in our island home that isn't reliant on outside imports of food and other goods.

What are the most important components of climate pollutant mitigation?

Anonymous Respondent: Cutting emissions from power plants and cars.

Anonymous Respondent: Lets focus on the unnecessary emissions of high impact GHGs. Many of the hotels have waste water treatment facilities that simply off gas the methane... they don't even burn it to reduce the climate impacts. This should be illegal.

Anonymous Respondent: Transit and Regulation improvements. Our transit model needs to move to a low carbon plan with walking, biking, public transit as top priority, then deliveries, then cars.

Regulations need to support more efficient vehicles (smaller), and development/zoning changes to allow greater density in the places where people need to live and work (IN TOWN)

Anonymous Respondent: Focus on CO2 mitigation--most other pollutants will ride in tandem.

Anonymous Respondent: The single simplest means to reduce climate pollution is to reduce consumption of products leading to pollutants, i.e. large gasoline and diesel vehicles, large energy consuming systems at homes (A.C. systems, second refrigerators, non-efficient refrigerators, gas or electric water heaters vs heat pumps or solar hot water systems). We need to focus on making all energy use as efficient as possible within the state. If one compares energy efficiency in Europe to that of the US, we are far behind. How can the state government influence or mandate actions to reduce consumption and energy efficiency statewide?

*Anonymous Respondent: A*ddress the biggest emitters that don't appear to be reducing - those in transportation

Anonymous Respondent: Market based measures.

Anonymous Respondent: Public understanding and acceptance of the best way to achieve this goal, from an engineering and a political point of view.

Anonymous Respondent: RE land availability or openness to undersea cables; VMT reduction and electrification

Anonymous Respondent: Retiring fossil fuel plants.

Sustainable Energy Hawaii: Developing energy systems with the capacity and durability to resist global competition 20 year from now.

*Sean Newsum (Airlines for America): T*he aviation sector has recognized that the preponderance of climate mitigation will necessarily have to come from a rapid and widespread transition to alternative fuels, commonly known as Sustainable Aviation Fuel (SAF). While electrification of aircraft is a subject of significant interest for Research & Development, near to medium term deployment of this technology is expected to occur for applications in Urban Air Mobility or Advanced Air Mobility – short range operations with less than 10 passengers. On a national level, the US government in its US Aviation Climate Action Plan has also recognized that aviation climate mitigation, while including incorporation of advanced and future aircraft technology, will rely on SAF tor the majority of CO2 emissions mitigation in the 2050 timeframe. While there may be opportunities to consider and pursue alternative propulsion technologies (battery electric, hydrogen fuel cell electric, and hydrogen combustion) for inter-Island air traffic in the 2040's, decarbonization of air traffic from Hawaii to mainland US destinations should be assumed to occur through the widespread adoption of SAF production and availability by fuel suppliers to US carriers operating from Hawaii. Therefore, HSEO should focus its efforts for aviation on strategies and policy to encourage the production and availability of SAF for flights departing from Hawaii airports.

While SAF production, availability, and use has been growing rapidly in recent years, SAF remains a nascent market relative to conventional jet fuel whose market has been established for several decades, but also relative to other renewable fuels such as Ethanol, Biodiesel, and Renewable Diesel which have become established and mature markets over the past 15-20 years. As a new emerging product competing in the established conventional jet fuel and renewable fuels markets, SAF requires

support from governments to become established, to scale up production, and benefit from economies of scale to accelerate growth. The US government, through the Inflation Reduction Act (IRA), has provided for a new SAF Blenders Tax Credit (BTC) and Clean Fuels Production Credit (CFPC) which will provide new incentives to potential SAF producers and reduce the competitive disadvantage that SAF faces today. Some individual states have adopted policies to complement the available federal incentives to further reduce the competitive advantage faced by SAF.

To fully achieve the strategic objective defined by HSEO for cost-effective decarbonization pathways, state level policies for Hawaii that complement federal incentives must be adopted. Illinois, Minnesota, and Washington have each adopted producer or purchaser tax credits within the past year to encourage the adoption of SAF in their states. We encourage the State of Hawaii to consider a similar approach.

Joe Kent (Grassroot Institute of Hawaii): It's most important to maintain a voluntary approach to any effort, rather than a coercive approach.

Leah Laramee (Hawai'i State Climate Change Mitigation and Adaptation Commission): Equity, ensuring actions don't curtail future actions, and moving quickly!

Jayne LeFors (Individual): Ending the use of fossil fuels as soon as possible.

What are the biggest barriers to meaningful climate pollution reduction?

Anonymous Respondent: Politics and policies.

Anonymous Respondent: Money, lifestyle changes and the infrastructure needed to change in a manner that isn't a sacrifice to people. Great public transportation can be such a useful and beneficial option for all parts of our communities, and people don't want to give up the freedom of driving or flying for an inconvenient, unpleasant, or unreliable alternative. Air traffic will have to continue.. can that full a huge push towards native reforestation?

Anonymous Respondent: Political will, a failure of vision, leadership structure of the state senate and legislative, they can't pass anything meaningful and wanted by the public because they are paternalistic and seem to be controlled by major business interests. I assume it's that or just plain corruption.

Anonymous Respondent: Near-total dependence on tourism, near total-dependence on single-driver automobiles.

Anonymous Respondent: Public ignorance and financial barriers erected by our competitive economic system that does not place a dollar value on our environment.

Anonymous Respondent: Political will and investment - we've known how to deal with these issues for the past decade, we've just not been able to implement the policies effectively.

Anonymous Respondent: It is other countries and jurisdictions. It is not Hawaii.

Anonymous Respondent: Politics and short term thinking

Anonymous Respondent: Funding; Labor (this includes having a competitive labor market, good compensation and benefits - we compete nationally for labor); Over regulation (don't let perfect be the enemy of the good); community acceptance

Anonymous Respondent: Community pushback.

Sustainable Energy Hawaii: Regulation, finance and public buy-in. They are inseparable.

Sean Newsum (Airlines for America): For aviation, the most important component of climate pollutant reduction is rapidly expanding production and availability of affordable, cost-effective SAF to air transport carriers serving Hawai'i.

Joe Kent (Grassroot Institute of Hawaii): The costs of achieving these goals has not yet been calculated, yet are likely to be in the billions of dollars. These costs will fall mostly on local residents.

Also, the end-of-life cycle issues with electric batteries at best threaten Hawaii's clean environment, and at worst have health and safety risks associated.

Leah Laramee (Hawai'i State Climate Change Mitigation and Adaptation Commission): Funding and capacity.

Jayne LeFors (Individual): Government subsidies for the fossil fuel industry and continued permitting of fossil fuel extraction projects. Politicians who have sold out as their re-election campaigns are being funded by fossil fuel corporations. Lack of urgency as we strive to maintain our consumerism-based economy rather than reducing consumption.

Additional Comments: Please feel free to include comments on scenario assumptions and past presentations here.

Anonymous Respondent: Ground source heat pumps (GSHP) are a great way to decarbonize HVAC and water heating demands. It increases the thermal efficiency from 1 for traditional air source heat pumps to 4 to 5 for GSHP. They can be installed within foundational structures such as pile foundations (energy piles), slabs and walls, tunnel lining, pavement, etc. (i.e.; any structural element in contact with the ground). They have been installed and used throughout Europe but there is growth in the U.S. Please consider this technology as a contributor to the mitigation strategy.

Anonymous Respondent: Have you seen Kenya's new national tree planting holiday... what would it take for the state nurseries and schools/offices to do that together in the public sector, and the private sector to step up and fund a complementary effort.

Anonymous Respondent: I'm glad the forum exists to review the strategy, I want forward progress.

Anonymous Respondent: Begin with rapid up ramp on fossil fuel taxes (inc. jet fuel) up to $2.00/gallon with income going to free bus rides and jitney shuttle services for all. Provide roaming guards on buses to encourage school children on buses. Double rebates for Energy Star appliances and EV's and

EV charging stations and subsidize small homes and apartments. Supply low-income families with very heavily subsidized Energy Star appliances, free ceiling fans and up to $10,000 and financing toward the purchase of >30 mpg cars with clunker trade in.

Anonymous Respondent: There was very little on behavioral approaches - much of the phrasing appeared to be more about tech adoptions. I'm not sure I agree with the VMT estimates for Oahu when HDOT estimates increases across all counties in their annual budget documents measures of effectiveness. It is clear that some forms of pricing will need to be introduced - I think it will also be important then to talk about the benefits of those actions past climate or decarb benefits. Like if we make walking and biking safer, we should see reductions in traffic fatalities and other cardiovascular or asthma issues in adults and kids, etc.

Anonymous Respondent: Thanks for all the work you did! It was a quick turnaround! Please find and update this study regularly to ensure we are on track and have recent data.

Stephanie Chang (Stephanie Chang Design Ink): Thank you for this report. And thank you so much for asking for feedback from the community about this report. It speaks volumes. Would be a dream, an aspiration, for community members to see themselves in this report. Maybe that's for a future time, where efforts to "bridge build" and translate this report will be particularly useful for engaging and involving community residents.

Sean Newsum (Airlines for America): Regarding the HSEO scenarios for aviation (reference Appendix, p. 31 of September 12th, HSEO Webinar presentation).

Scenario 2: High Electrification

- Fuel efficiency improvements in aviation: 50% of the reference efficiency forecast from the Annual Energy Outlook (less efficiency than forecasted for the mainland given the relatively newer fleet of airplanes in Hawai‘i)”
- “10% SAF blend by 2030, 40% SAF blend by 2045”
- “Increase in electric inter-island aviation, for applicable flights only, by 2045 (start ramping up in 2040)”

Comment: Scenario 2 adds SAF availability and use targets for 2030 and 2045. The 2030 target is consistent with the commitments of several A4A member airlines and similar to the national SAF Grand Challenge target when considered proportionally. A4A and its member airlines have not established SAF targets for 2045, but A4A and its members have committed to “net zero” carbon emissions by 2050 and support the ambitious goal of the U.S. government’s SAF Grand Challenge of “supplying sufficient SAF to meet 100% of aviation fuel demand by 2050”, which supports and aligns with the United States 2021 Climate Action Plan. While a 40% SAF blend by 2045 is highly ambitious, our overarching goal for 2050 is arguably more so and it would be preferable for Hawai’i to align with overall U.S. targets to the extent possible. Technological readiness for electric power aviation necessary for inter-island aviation is still immature and it is unclear whether technology will mature sufficiently by 2040 to meet the ambition of the HSEO Decarbonization Strategy.

Scenario 3: High Electrification plus additional demand reductions

- "Fuel efficiency improvements in aviation: 100% of the reference efficiency forecast from the Annual Energy Outlook"
- "10% SAF blend by 2030, 40% SAF blend by 2045"
- "Increase average length of stay to reduce flight miles while maintaining tourist activity"
- "Increase in electric inter-island aviation, for applicable flights only, by 2045 (start ramping up in 2040)"

Comment: Scenario 3 adds air travel demand reductions, while assuming to maintain tourist activity. The view of A4A and its member airlines is that demand reduction as a policy objective is inappropriate and could have negative, unintended consequences. The specific assumption to reduce flight miles through policies to increase average length of stay is impractical and unreasonable. Average length of stay for visitors to Hawaii had been declining prior to the COVID-19 pandemic. Average length of stay is a metric that is influenced by many external economic factors (including hotel costs which have been increasing in Hawaii in recent years) and it is not easily influenced through policy. Policy measures aimed at air travel demand reduction could have adverse and unintended consequences of reducing overall economic activity. The focus of Hawai'i's decarbonization strategy should be to reduce carbon emissions in the most cost-effective manner without impacting economic activity.

Scenario 4: 50% by 2030 Achievement

- "Fuel efficiency improvements in aviation: 100% of the reference efficiency forecast from the Annual Energy Outlook"
- "15% SAF blend by 2030, 40% SAF blend by 2045"
- "Increase average length of stay to reduce flight miles while maintaining tourist activity"

Comment: Scenario 4 increases the SAF blend objective for 2030 from 10% SAF blend to a 15% SAF blend objective. In addition to our comments regarding Scenario 3 and the increasing length of stay scenario, we note that the existing 10% SAF blend target is highly ambitious as it stands, and increasing the blend target to 15% can only be achieved with very aggressive Hawai'i government incentives designed to drive greater SAF availability in Hawai'i.

Leah Laramee (Hawai'i State Climate Change Mitigation and Adaptation Commission): Mahalo for your work!

Paul Bernstein (Individual): I'm concerned with how the cost estimates that were displayed in the November presentation will be used. These costs fail to reflect the total cost of the pathways. The costs reflected in Scenario 2 illustrate my point as they are negative. If this were true, then it suggests many people are making decisions against their interests now, but that's untrue. People are using their car because it is more efficient for them than other modes of transport. A VMT reduction will come at a cost in both money and time. I fully agree that we need to reduce our VMT, but we need to recognize that to do so means spending money to make public transit, walking, cycling, and other non-vehicle modes of travel more attractive from a cost, time, and safety standpoint. Therefore,

when estimating the cost of transport, I recommend accounting for the full cost and not simply the fuel costs involved in the different pathways.

Appendix A-3: Online Survey Responses from November 14 Webinar

During the November 14, 2023 webinar, HSEO and E3 presented the draft technical modeling results and issued a slightly different survey to attendees. HSEO asked the following questions via this survey:

- Based on the results presented, what types of carbon mitigation policies would you recommend the state prioritize?
- Given the presentation today and draft results - what are the recommendations you think should be prioritized for the report to the state legislature?

A total of 31 attendees responded to the survey. All responses were anonymous, and similar to the other survey, the respondents did not have to answer every question. The verbatim survey responses are included below, altered only to correct spelling and grammatical errors, and grouped by question.

Based on the results presented, what types of carbon mitigation policies would you recommend the state prioritize?

The ones with total savings that include societal benefits of decarbonization
VMT reduction and mode shift
Carbon pricing
Those that also advance resiliency/adaptation
Scenario 2 (because it's the net-savings pathway). Heavy mode-shift to public transit, walking, biking.
Zero energy buildings.
Transportation Policies: Encourage the adoption of electric vehicles, improve public transportation, and invest in infrastructure for walking and biking to reduce carbon emissions from transportation.
Greater focus on fuel switching versus electrification of ground transportation
Transportation modal-switch, building neighborhoods and transportation infrastructure that encourage people to walk, bicycle, and catch transit
Carbon cashback - both efficient and helps low- and middle-income families
Import substitution; Conversion of internal combustion engine vs only new sales of ZEV passenger vehicles
Mitigation policies: • Carbon accounting by total greenhouse gas lifecycle, not just point-source or emissions within Hawaii.

- Multi-sector improvements, such as policies that support local food production as a method of decarbonization, and including displacement of imported meat, dairy, eggs, and proteins as well as fruits and vegetables
- Apply “electrification of everything” policy to the specific sectors and uses where that makes sense, such as light passenger vehicles. Do not allow that electrification enthusiasm to prioritize “solutions” that are less efficient and more costly than other measures, such as fuel switching
- Fuel switching policy that makes it easier to design, permit, install, operate, and switch to locally-produced renewable fuels for hotels, restaurants, heavy, marine, and air transportation

Agricultural and (Re)Forestation activities that incorporate large scale carbon sequestration for carbon credits that does not remove land from ag production capacity

They all seem necessary, but their implementation all look very daunting if community / public buy-in on the solution isn't secured. These are dramatic changes that impact everyone and at very least impacts the already expensive cost of living in Hawaii.

Legislature needs to pass legislation requiring building energy efficiency requirements with strict deadlines, beginning with state and county owned buildings.

Policies that require/incentive deep energy retrofits to existing buildings.

Energy efficiency, VMT reduction & mode shift

I would de-emphasize policy on adoption of electric vehicles and EV charging for light passenger vehicles. All of the major automakers have announced electric models, and in some cases (like Volkswagen), non-electrical options are not even manufactured any more. The State of Hawaii does not need to invest precious resources to get car buyers to switch to electrical.

More emphasis on fuel switching for ground transportation

On the opposite end of better complete streets to contribute to transportation, for farther out communities looking at equivalent activities and supports to not penalize the needs for high private vehicle usage, but helps to find good alternatives.

Tie the decarbonization plan to a climate adaptation/resiliency plan. These need to be integrated.

Prioritize landscape restoration: removal and eradication of invasive species, and replacement with native and less fire-prone species, on conservation and Class C/D agricultural lands. This will be a priority after the Maui fires anyway, it might as well also help support decarbonization efforts. Wildfire is also a GHG polluter.

Given the presentation today and draft results - what are the recommendations you think should be prioritized for the report to the state legislature?

Same as above [The ones with total savings that include societal benefits of decarb]
VMT reduction and mode shift
Deep changes to transportation infrastructure to incentivize transit, walking, biking
Strongly recommend shifting to a consumption based inventory model to more accurately reflect HI's emissions.
BEV transition, mode shift, support for clean energy transition so costs not all passed to customer
Consider additional consumption based emissions inventory (like Oregon's) for Hawaii
To facilitate mode shift, heavy investment in safe and protected bike/ped/trail NETWORKS in areas with vulnerable users and where there is a high percentage of trips within a 3 mile distance
Carbon Pricing Framework: Recommend the development and implementation of a carbon pricing mechanism, such as a carbon tax or cap-and-trade system, to incentivize businesses to reduce carbon emissions.
• Apply "electrification of everything" policy to the specific sectors and uses where that makes sense, such as light passenger vehicles. Do not allow that electrification enthusiasm to prioritize "solutions" that are less efficient and more costly than other measures, such as fuel switching • Fuel switching policy that makes it easier to design, permit, install, operate, and switch to locally-produced renewable fuels for hotels, restaurants, heavy, marine, and air transportation
Ban on internal combustion engine vehicle sales
Without meaningful carbon pricing, policy interventions risk being somewhat arbitrary and can only calibrate to the 'relative pain' of each individual sector without connectivity to the broader goal. Every sector will tend to say 'we can't do this - what about the emissions of another sector. Aren't they more impactful?

Appendix A-4: Letters from Stakeholders

The pages that follow are a record of the five letters received providing input on the draft Decarbonization Report from the Hawai‘i State Office of Planning and Development, Hawaiian Airlines, Island Energy Services, Carbon Cashback, and Par Hawaii.

STATE OF HAWAIʻI OFFICE OF PLANNING & SUSTAINABLE DEVELOPMENT

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September 12, 2023

Ms. Monique Schafer
Decarbonization Program Manager
Hawaiʻi State Energy Office
Via email to: monique.m.schafer@hawaii.gov

Aloha Monique,

Mahalo for hosting today's Decarbonization Stakeholder Outreach Meeting, in accordance with Act 238, Session Laws of Hawaiʻi 2022.

The Statewide Sustainability Branch, as authorized by Hawaiʻi Revised Statutes §225M-8, is the state entity required to develop, organize, and promote policies and programs that assist in the meeting of Hawaiʻi's numerous sustainability and climate policies and goals, as well as is required identify, evaluate, and make recommendations regarding proposed legislation, regulatory changes, or policy modifications to the Governor, the Legislature, government agencies, private entities, and other bodies for the purpose of encouraging activities that best sustain, protect, and enhance the quality of the environment, economy, and community for the present and future benefit of the people of Hawaiʻi.

To support your agency's work to achieve the mandates set forth in Act 238, the Office of Planning and Sustainable Development's Statewide Sustainability Branch would like to share the following state plans, information, and energy and greenhouse gas emissions statutory targets for consideration, inclusion, and alignment with your efforts.

State of Hawaiʻi Plans and Studies:

- **Hawaiʻi 2050 Sustainability Plan**: Pursuant to Hawaiʻi Revised Statutes §226-65, the Hawaiʻi 2050 Sustainability Plan legally serves as the State of Hawaiʻi's combined climate and sustainability strategic action plan. The Hawaiʻi 2050 Sustainability Plan was recently published in 2021, and consolidated the U.N. Sustainable Development Goals, over 150 state plans and laws, multiple county climate and sustainability plans and general plans, and the voluntary Aloha+ Challenge. The plan determined during the 2020-2030 "Decade of Action" that eight (8) focus Areas should be achieved: Promote a Sustainable Economic Recovery, Reduce Greenhouse Gas Emissions, Improve Climate Resilience, Advance Sustainable Communities, Advance Equity, Institutionalize Sustainability, Preserve the Natural Environment, and Perpetuate

Traditional Ecological Knowledge and Values. These eight (8) foci identify 38 strategies, and 262 recommended actions.

The Statewide Sustainability Branch requests that the State's Decarbonization Study align with and include the State's official climate and sustainability strategic action plan's recommendations. The Hawai'i 2050 Sustainability Plan is available online at: https://hawaii2050.hawaii.gov, please contact me should you have any questions.

- **Hawai'i Statewide Transportation Plan**: Pursuant to Hawai'i Revised Statutes Chapter 279A, the Hawai'i Statewide Transportation Plan (HSTP) is required to be updated every ten (10) years as a framework to be used in the planning of the statewide transportation system and provide an outlook for 20-25 years. The Department of Transportation recently began their HSTP update in 2022 and published a draft version of their plan, to provide guidance for Hawai'i's transportation system through 2045 as an overarching policy document that guides the system-level and master plans of the three primary modes of transportation. The HSTP is available online at: https://hidot.hawaii.gov/administration/files/2022/12/HSTP_Exec_Summ_2022_compressed.pdf, and https://hidot.hawaii.gov/administration/files/2022/12/HawaiiStatewideTransPlan_Draft_compressed.pdf.

- **Hawai'i Greenhouse Gas Emissions Report for 2005, 2018, 2019 Final Report published April 2023:** Pursuant to Hawai'i Revised Statutes Chapter 342B, Part VI, the Hawai'i Department of Health is responsible for the tracking of greenhouse gas emissions to determine the State's progress in the reduction of greenhouse gas emissions. This most recent emissions report was published in April 2023 and presents the updated greenhouse gas emissions estimates for 1990, 2007, 2010, 2015, 2016, and 2017; as well as developed emissions estimates for 2005, 2018, and 2019; and emissions projections for 2020, 2025, 2030, 2035, 2040, and 2045. This updated Hawai'i Greenhouse Gas Emissions Report is available online at: https://health.hawaii.gov/cab/files/2023/05/2005-2018-2019-Inventory_Final-Report_rev2.pdf.

- **Feasibility and Implications of Establishing a Carbon Offset Program for the State of Hawai'i:** Pursuant to Act 16, Session Laws of Hawai'i 2018, the Office of Planning and Sustainable Development, in partnership with the State Greenhouse Gas Sequestration Task Force, investigated the feasibility of establishing both a state-program administered and state-offset project developer scenarios for a potential Carbon Offset Program for the State of Hawai'i. This study found that it would be unlikely that the State of Hawaii would generate significant revenue through the production of offsets, and that any trading of offset credits purchased within Hawai'i would be limited by the state's Zero Emissions Clean Economy target. This report is available online at: https://files.hawaii.gov/dbedt/op/sustainability/feasibility_and_implications_of_establishing_a_carbon_offset_program_for_the_state_of_hawaii_finalweb.pdf.

State of Hawai‘i Climate and Sustainability Statutory Targets

As you are aware, there are over 20 climate and sustainability statutory targets enacted by the State of Hawai‘i. The following statutory targets provided below are specifically energy-related or related to the state's greenhouse gas emissions:

2030 Statutory Targets:

1. **Energy-Efficiency Portfolio Standards Target:** Requires the PUC to establish the Energy-Efficiency Portfolio Standards (EEPS) target requiring that **4,300** gigawatt hours (GWh) of electricity use statewide be reduced **by 2030**.
   (Hawai‘i Revised Statutes §269-96)

2. **Renewable Portfolio Standard Target:** Requires each electric utility company that sells electricity to establish a renewable portfolio standard (RPS) of **40%** of its net electricity generation **by 12/31/2030**.
   (Hawai‘i Revised Statutes §269-92)

3. **Greenhouse Gas Emission Limit:** Establishing a statewide Greenhouse Gas Emissions Limit target to be **50%** below the level of statewide greenhouse gas emissions in 2005, to be achieved **no later than 2030**.
   (Hawai‘i Revised Statutes §225P-5)

4. **State Fleet ZEV Transition:** Requires the State to transition **all** light-duty motor vehicles that are passenger cars in the State's fleet to be zero-emission vehicles **by 12/31/2030**.
   (Act 74, Session Laws of Hawai‘i 2021, codified as HRS §§ 225P-7, 264-20.7, and 196-9 (c) (11), as amended.)

2035 Statutory Targets:

1. **Hawai‘i Department of Education Net-Zero Energy Target**: Requires the Hawai‘i Department of Education to become **net-zero** in energy use, producing as much renewable energy as it consumes across all public schools **by 01/01/2035**.
   (Hawai‘i Revised Statutes §320A-1510)

2. **University of Hawai‘i Net-Zero Energy Target:** Requires the UH to become **net-zero** in energy use, producing as much renewable energy as it consumes across all campuses **by 01/01/2035**.
   (Hawai‘i Revised Statutes §304A-119)

3. **State Fleet ZEV Transition:** Requires the State to transition **all** light-duty motor vehicles in the State's fleet to be zero-emission vehicles **by 12/31/2035**.
   (Act 74, Session Laws of Hawai‘i 2021, codified as HRS §§ 225P-7, 264-20.7, and 196-9 (c) (11), as amended.)

2040 Statutory Target:

1. **Renewable Portfolio Standard Target:** Requires each electric utility company that sells electricity to establish a renewable portfolio standard (RPS) **70%** of its net electricity generation **by 12/31/2040.**
   (Hawai'i Revised Statutes §269-92)

2045 Statutory Targets:

1. **Renewable Portfolio Standard Target:** Requires each electric utility company that sells electricity to establish a renewable portfolio standard (RPS) **100%** of its net electricity generation by **12/31/2045**.
   (Hawai'i Revised Statutes §269-92)

2. **Zero Emissions Clean Economy Target:** Requires the State to sequester more atmospheric carbon and greenhouse gases than emitted within the state as quickly as practicable, but no later than **2045**.
   (Hawai'i Revised Statutes §225P-5)

Please let me know if I can be of further assistance, in support of the Hawai'i State Energy Office's statewide and economy-wide decarbonization study. Please feel free to contact me at Danielle.m.bass@hawaii.gov.

Mahalo!

Danielle M. M. Bass
State Sustainability Coordinator
Office of Planning and Sustainable Development
State of Hawai'i

November 17, 2023

Mr. Mark Glick
Chief Energy Officer
Hawaii State Energy Office
235 S. Beretania Street, 5th Floor
Honolulu, HI 96813

Subject: Hawaii State Energy Office Decarbonization Study

Dear Mr. Glick,

Hawaiian Airlines greatly appreciates the opportunity to provide input into the Hawaii State Energy Office's (HSEO) Act 238 Decarbonization Study. We applaud the State of Hawaii's leadership in establishing long term economy-wide decarbonization targets and conducting analysis on the viability of various decarbonization pathways. We appreciate HSEO's efforts to share an overview of its proposed approach to the decarbonization analysis and solicit feedback from the community.

The U.S. airline industry (represented by the trade organization Airlines for America (A4A) and its member carriers, including Hawaiian Airlines) is committed to limiting and further reducing greenhouse gas ("GHG") emissions. On March 30, 2021, A4A member carriers pledged to work across the aviation industry and with government leaders to achieve net-zero carbon emissions by 2050 ("2050 NZC Goal"). This pledge continues A4A carriers' longstanding commitment to address climate change and reduce commercial aviation's GHG emissions footprint. A4A's 2050 NZC Goal parallels the Biden Administration's goal of achieving net-zero GHG emissions in the aviation sector by 2050, included in its Aviation Climate Action Plan announced November 9, 2021 ("Aviation CAP").

The U.S. airline industry and the Administration also share the conviction that sustainable aviation fuel (SAF) will be critical to meeting the industry's ambitious climate goals. The Administration's Aviation CAP agrees with every credible analysis in concluding that SAF "will be critical to the long-term decarbonization of aviation" and "to aviation's ability to meet the net-zero goal." This is the core impetus for the Administration's policy – manifested in the SAF Grand Challenge – to make 3 billion gallons of cost-competitive SAF available to U.S. aircraft operators in 2030. On September 9, 2021, in harmony with the Biden Administration's announcement of the SAF Grand Challenge, A4A and its members pledged to work with government leaders and other stakeholders to make 3 billion gallons of cost-competitive SAF available to U.S. aircraft operators in 2030, thereby increasing its prior 2030 SAF Goal by 50 percent.

While electrification of aircraft is a subject of significant interest for Research & Development, near to medium term deployment of this technology is expected to occur for applications in Urban Air Mobility or Advanced Air Mobility – short range operations with

less than 10 passengers. On a national level, the U.S. government in its U.S. Aviation Climate Action Plan has also recognized that, while incorporation of advanced and future aircraft technology is important, the sector will rely on SAF for the majority of CO2 emissions mitigation in the 2050 timeframe. While there may be opportunities to consider and pursue alternative propulsion technologies (such as battery electric, hydrogen fuel cell electric, or hydrogen combustion) for inter-island flights in the 2040's (subject to the availability of sufficient renewable power generation capacity), decarbonization of flights by U.S. carriers from Hawaii to transpacific destinations and within the state should be assumed to occur through the widespread adoption of SAF production and availability by fuel producers and suppliers. Therefore, we recommend that HSEO focus its aviation decarbonization efforts on strategies and policies to encourage the production and availability of cost-competitive SAF for flights departing from Hawaii airports. Aviation decarbonization can only be met through a strong public-private partnership between the government and aviation stakeholders, including airlines and also fuel producers. Hawaii state government has a critical role to play in incentivizing and supporting the availability of commercially viable SAF from fuel producers. SAF is a nascent industry and the cost of production of SAF is currently 2 to 5 times that of conventional jet fuel. The SAF industry needs government incentives to drive adoption of SAF and get to scale.

Hawaiian Airlines strongly support tax incentives – in particular the U.S. federal government SAF Blenders Tax Credit (SAF-BTC) – needed to catalyze SAF production and adoption. The Biden Administration also strongly advocated for the enactment of these incentives and we are thankful for the critical support the Administration provided to ensure enactment of the SAF-BTC and Clean Fuels Production Credit (CFPC) – as well as other tax incentives like the Clean Hydrogen Credit – that will provide support vital to successfully engendering exponential growth in domestic SAF production through 2030. While the national SAF Grand Challenge will provide necessary support to the Hawaii decarbonization strategy, to fully achieve the strategic objective defined by HSEO for cost-effective decarbonization pathways, state level policies for Hawaii that complement federal incentives must be adopted. Illinois, Minnesota, and Washington have each adopted producer or purchaser tax credits within the past year to encourage the adoption of SAF in their states. Given the scarcity of supply of SAF, Hawaii will need incentives that are competitive with other U.S. states in order to attract supply of SAF to Hawaii. We believe state-level tax credits will be the most effective mechanism to advance the use of SAF in Hawaii and contribute to Hawaii's decarbonization goals.

In addition, we have reviewed the presentations from the Sept 12, 2023 and Nov 14, 2023 webinars and have the following comments:

- GHG inventory: Sept 12 presentation, Pg 11: We understand that the state's GHG inventory does not include upstream emissions for fuels produced outside of Hawaii. We are concerned that this leads to a bias against the local production of renewable fuels. We believe Hawaii will need a combination of both locally produced SAF as well as imported SAF in order to meet aviation demand and

HAWAIIAN AIRLINES

decarbonize the aviation sector. We believe the opportunity for local production of SAF is important because it provides additional assurance of supply for Hawaii's economy, and contributes to sustainable economic development for the state. We believe it's important to consider the positive contributions that a local SAF economy can create, rather than only the GHG reduction impact, when considering policies to advance aviation decarbonization.

- Evaluation criteria: Sept 12 presentation, Pg 22: We recommend to add 'economic impact' to the list of scenario evaluation criteria. For example, policies aimed at aviation demand reduction would likely have a negative impact on the economic activity of the state and those impacts should be considered in the evaluation.
- Scenario assumptions: Sept 12 presentation, Pg 31: Scenarios 3 and 4 include an assumption to 'increase the average length of stay to reduce flight miles while maintaining tourist activity.' We do not view this as a realistic assumption, especially considering the significant increase in hotel costs in Hawaii over the past several years, with total trip cost being a primary driver of length of stay. Average length of stay for visitors to Hawaii had been declining in the years prior to the COVID-19 pandemic. Average length of stay is a metric that is influenced by many external economic and structural factors and not easily influenced by policy. Policy measures aimed at achieving air travel demand reduction could have the adverse and unintended impact of reducing overall economic activity within the state. The focus of Hawaii's decarbonization strategy should be to reduce carbon emissions in the most cost-effective manner while supporting economic activity.
- Scenario assumptions: Nov 14 presentation, Pg 34: Scenario S2 includes an assumption to reduce flight miles by 10% by 2030. Similar to our comments on the Sept 12 presentation, we recommend to add 'economic impact' to the evaluation criteria for these scenarios. Policies aimed at air travel demand reductions reduction could have the adverse and unintended impact of reducing overall economic activity within the state, and those impacts should be included in the evaluation. The focus of Hawaii's decarbonization strategy should be to reduce carbon emissions in the most cost-effective manner while supporting economic activity.

For more than 94 years, Hawaiian Airlines has been providing air transportation to Hawaii residents and visitors. As Hawaii's airline, we are committed to climate action to secure the future of our island home. Thank you for the opportunity to provide feedback to this important study.

Sincerely,

Avi Mannis
EVP, Chief Marketing Officer
Hawaiian Airlines

Jon Mauer
President and CEO

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November 2, 2023

Mark Glick
Chief Energy Officer
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Cc: Monique Shafer
Decarbonization Program Manager
monique.m.schafer@hawaii.gov

Dear Mark,

Thank you for the opportunity to comment on Strategies to Decarbonize Hawai'i: Webinar on HSEO's Act 238 Study.

Island Energy Services Downstream, LLC (IES) is supportive of the State's goals to be carbon neutral by 2045 and is eager to play a major role in enabling a carbon neutral Hawai'i. We are well aware of the challenges ahead of us to achieve these goals.

Based in Kapolei, IES is a Hawai'i-based fuels logistics and marketing business providing premier fuel products for the State of Hawai'i. Our company has over 280 local employees and reliably serves retail, industrial, aviation, military, and utility customers throughout the state through a network of key storage and distribution assets comprised of fuels terminals and pipelines. IES is uniquely positioned to provide the services needed to import, store, and distribute renewable products throughout Hawai'i to assist in decarbonizing the State.

Please find our comments on Decarbonize Hawai'i: Webinar on HSEO's Act 238 Study in the attached. We look forward to having more detailed discussion on these topics in the near future.

Best Regards,

Jon Mauer
President and CEO
Island Energy Services, LLC

Strategies to Decarbonize Hawai'i: Webinar on HSEO's Act 238 Study.
Island Energy Services' Comments, November 2, 2023

Act 238's Goal of 50% of 2005 by 2030

As discussed in E3's April 2023 Report Hawai'i Pathways to New Zero - An Initial Assessment of Decarbonization Scenarios, Act 238's goal of achieving 50% of 2005 carbon emissions by 2030 appears un-attainable even in the most aggressive scenarios. The transportation and electrical sectors both have high technical, infrastructure, supply, and behavioral hurdles to overcome in a very short timeframe. We would like to see a more pragmatic approach that sets reachable goals for 2030 that can be a foundation for Hawai'i's ultimate 2045 net zero goal.

Decarbonization Policies and Regulations

As discussed in E3's April 2023 Report Hawai'i Pathways to New Zero - An Initial Assessment of Decarbonization Scenarios, "additional policies and regulations are needed to ensure the deployment of decarbonization strategies". Part of these additional polices and regulations should be a form of "Carbon Pricing" to provide the proper commercial incentives for decarbonization across all sectors, including the electrical sector.

Carbon pricing is needed to put Hawai'i on a level playing field with other states and countries that have or will have carbon pricing programs. To date, LCFS programs have been the most popular form of carbon pricing. LCFS programs have been established in California, Oregon, and Washington, as well as British Columbia. LCFS bills have been considered in New Mexico, Minnesota, Illinois, Michigan, and New York. Hawai'i will be in direct competition with the U.S. West Coast states and British Columbia for renewable fuels and without a carbon pricing or similar LCFS program, Hawai'i will be at a distinct commercial disadvantage to attract renewable fuels.

In-State Biofuels vs. Imports

Producing in-state biofuels will likely be very limited. E3's April 2023 Report Hawai'i Pathways to New Zero - An Initial Assessment of Decarbonization Scenarios discusses "Decarbonized fuels could be locally produced in the State of Hawai'i from a variety of biogenic feedstocks. The two general categories of feedstocks are 1) biomass residues from agricultural, forestry, and municipal waste; and 2) dedicated energy crops."

Reliance on dedicated in-state energy crops will require a tremendous amount of land. For example, energy grass is a higher yielding crop that can produce 7.5 barrels of biodiesel per acre annually.[1] In order to produce 10,000 barrels per day of biofuel (or less than 10% of Hawai'i's current fossil fuel demand), nearly 500,000 acres of land is required. For reference, Oahu totals 386,000 acres. Hawai'i will need to import substantial amounts of renewable fuel to meet their goals. Production of in-state biofuels is only a small part of the solution.

Life Cycle Approach to Carbon Intensity

The Pathway's approach for renewable fuels required for 2030 and 2045 goals do not take into account a Carbon Intensity (CI) lifecycle approach for these fuels including the actual CI of the fuel (the assumption is that all renewable fuels have a CI index of zero), and the manufacturing and transportation impacts.

For reference, CI lifecycle approaches form the basis for most of the tax credits established by the federal IRA and the LCFS programs in CA, OR, and WA.

Hawai'i's reliance on renewable fuels will be substantial, especially for aviation and power generation. Imports will make up the bulk of these renewable fuels as in-state renewable fuel production is extremely limited due to the amount of land required for renewable fuel production. Consideration should be given to consider the "life cycle" CI for all renewable fuel consumption and the ultimate impact on Hawai'i's decarbonization strategy.

Inflation Reduction Act

The recently enacted federal Inflation Reduction Act (IRA) includes the sunsetting of the Biomass-Based Diesel Blenders Tax Credit (BTC) at the end of 2024 and replaces it with the Section 45Z Clean Fuel Production Tax Credit (CFPC) defined in Section 13704 of the IRA. This new policy will have significant impacts on both Sustainable Aviation Fuel (SAF) and biomass-based diesels and other fuels. Stillwater Associates have summarized the impacts, and their findings and conclusions can be found here:

https://stillwaterassociates.com/inflation-reduction-act-sustainable-aviation-fuel-credit-carbon-intensity-matters/

https://stillwaterassociates.com/so-long-btc-hello-cfpc/

Of particular interest to us, and to Hawai'i, is the Act's requirement that: "The credit can only be earned for production of fuels in the United States". This has strong implications for Hawai'i and significantly limits Hawai'i's supply of imported renewable fuels including SAF and renewable fuels for power generation. Due to Jones Act shipping requirements and general supply and demand balances on the U.S. West Coast, the bulk of Hawai'i' liquid energy imports come from northeast Asia. Market forces on the U.S. West Coast and costly Jones Act shipping rates will likely prohibit any significant volumes of renewable fuels reaching Hawai'i. For example, large quantities of renewable fuels, including SAF, are and will be produced by Neste in Singapore. Hawai'i is a natural market for these fuels. But as written, the IRA will create a substantial economic barrier and prevent any of these fuels from reaching Hawai'i.

Hawai'i state delegation/representation, suppliers, and other stakeholders should consider lobbying for some form of Hawai'i exemption. For example, the IRA does have exemption language for critical minerals used in electric vehicles that allow "critical minerals …extracted, processed, and/or recycled domestically or in a country the U.S. has a free trade agreement with". The state might also, on its own, consider establishing a credit to offset the barrier of imports not qualifying for IRA credits.

1 Energycane produces more biodiesel than soybean at a lower cost, by Marianne Stein, July 8, 2021, University of Illinois, Institute for Genomic Biology

Carbon Cashback

Aloha Hawaii State Energy Office:

Mahalo for opportunity to submit comments on the decarbonization study. I am submitting these comments on behalf of Carbon Cashback Hawai'i. The remainder of the document makes the case for including carbon cashback in the set of policies Hawai'I should implement to reduce its greenhouse gas emissions.

Mahalo nui loa,
Dr. Paul Bernstein
www.carboncashbackhawaii.org

To help compare some of the common policies considered to address greenhouse gas emissions and to help rank recommendations that are likely to arise in the decarbonization study, Carbon Cashback Hawai'I has created the color-coded table below that qualitatively evaluates different policies across a number of metrics that the decarbonization study is tasked with considering. Dark green indicates the best policy; and red, the worst. A glance at the table suggests that a policy that places a fee on carbon emissions and returns the revenues to residents (Carbon fee w/ dividends to residents, or carbon cashback) scores well for every metric, and outperforms every other policy for the metrics as a whole. It is the most cost-effective policy and provides the greatest benefits to low- and moderate-income households. This is not to say that carbon fee with dividends can or should serve as the *sole* policy to achieve decarbonization, but rather that it is almost certainly part of "the most cost-effective and equitable pathway to decarbonization" to be identified under Act 238 (2022), and it performs well in terms of all the other criteria to be considered under the Act.

Table: Comparison of Policies to Reduce Emissions from Fossil Fuels

	Metrics								
	Overall	Impacts on Economy			Effects Emission Reductions				Jobs
	Measure	Households	Government		Sectors				
Policies	Cost-Effectiveness (highest to lowest)	Benefits Disadvantaged\Low *ncome* Communities Most	Administrative Cost (Ease of Implementation)	Effect on Government Budget	Ground Transportation	Air Travel and Shipping	Electricity	Carbon Capture and Sequestration	Accelerates Green Jobs & Tech
Carbon fee w/ dividends to residents				Neutral				*	
Carbon fee w/o dividends				Increases				*	
Efficiency standards - Buildings				Neutral					
Efficiency standards - Appliances				Neutral					
Mandates (e.g., no gas water heaters)				Neutral				*	
Subsidies w/ Income Thresholds				Decreases					
Subsidies w/o income thresholds				Decreases				*	
VMT Tax				Increases					

Legend
- **Best**
-
- **Moderate**
-
- **Worst**

* Credits could be given for sequestration. In which case these policies would have a positive impact on carbon sequestration.

Cost-Effectiveness is a measure of the cost per ton of emissions abated. The carbon pricing policies offer the best cost-effectiveness because they address emissions throughout the economy, which means they address emissions from existing and future technologies. Mandates and efficiency standards address emissions from new technologies and often limit choices and are sector specific. Subsidies are sector specific, address only new technology, and suffer from the free rider problem -- the government pays people or companies to do something that they would have done without the money thus leading to inefficiencies.[1]

Benefits Disadvantaged Communities. Carbon pricing with return of revenues to people is the clear winner as this policy provides a mechanism to make most low- and moderate-income households whole.[2] The policy is progressive since it returns the revenues to individuals in equal shares. Efficiency standards raise costs making capital more expensive and harder for low-income households to purchase. Mandates often create the same problem. The VMT tax and carbon pricing with no return of revenues to people are the worst policies and most regressive since lower income households spend a greater share of their income on energy and travel. Subsidies without income limits generally benefit only the higher income households. Subsidies with income thresholds are better but the poor cost-effectiveness in California's implementation suggests that few lower income households can take advantage of the subsidies and clearly the least wealthy would still be unable to make use of the subsidies.

Administrative Cost (Ease of Implementation): No new administrative infrastructure is needed to implement carbon pricing with dividends as this policy can be implemented by making use of two existing State tax frameworks: for the pricing, the existing Environmental Response, Energy, and Food Security Tax of Chapter 243-3.5, Hawaii Revised Statutes ("barrel tax") (i.e., increasing the tax rate to specified levels), and for the dividends, the Income Tax Law of Chapter 235 of Hawaii Revised Statutes (i.e., providing a new refundable tax credit). A VMT tax could be relatively easy to implement and require little new administrative cost if it were combined with the existing vehicle inspection program that already records a vehicle's odometer reading. Then regulators could asses the VMT tax payment and require this be paid in order to register a vehicle. The ease of implementing these pricing mechanisms contrasts with the regulatory policies such as efficiency standards, mandates, and subsidies. These programs would require new oversight measures and infrastructure to differing degrees. Subsidies would require new income tax forms and verification that purchases qualified for the subsidy. The burden would be worse if there were income thresholds as this policy would require more oversights to ensure no cheating. Mandates generally require new rules and regulations to be put in place coupled with sometimes very bureaucratic oversight. The same drawbacks apply to efficiency standards. The appliance standards would likely be the worst because they would need to be combined with a subsidy program to induce consumers to purchase more efficient appliances as the State probably cannot realistically restrict the sale of appliances that fail to meet a given standard.

Effect on Government Budget: Carbon fees with dividends, efficiency standards, and mandates have negligible impacts on the government's budget. In contrast, subsidies are a drain on the budget and

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[1] California Climate Investments, '2023 Mid-Year Data Update," (May 2023).

[2] University of Hawai'i Economic Research Organization, "Carbon Pricing Assessment for Hawai'i: Economic and Greenhouse Gas Impacts" (April 2021) and University of Hawai'i Economic Research Organization, "Hawai'i Carbon Pricing Study: Additional Scenarios & Administrative Considerations," (Dec 2021).

require either additional funds to be raised (i.e., taxes increased) or cut backs in current government services. The VMT tax and carbon fees without dividends increases the government budges but does so in a regressive manner thus further financially challenging low- and moderate-income households.

Ground Transportation: Of the policies that affect emissions from ground transportation, pricing carbon and therefore placing a fee on fossil-based transportation fuels is the best policy for the following reasons. First, it addresses all CO2 emissions from both existing and new vehicles. Subsidies only address emissions from new vehicles.[3] Second, it addresses emissions directly unlike a VMT tax, which addresses a proxy for emissions namely miles traveled. The simplest VMT tax treats all vehicles the same and so makes no distinction as to the true on-road efficiency of each vehicle. As a state (that is in compliance with the Clean Air Act) for which the EPA has not granted an exemption like California, Hawaii cannot implement mandates addressing ground transportation such as requiring improved fuel efficiency or a certain share of new vehicles to be electric.

Air Travel and Shipping: Apart from carbon pricing, the state probably has few options to reduce emissions from air travel and shipping in a cost-effective manner.

Electricity: Carbon pricing offers a comprehensive way to address all emission from the electric sector. This policy contrasts with efficiency standards, mandates, and subsidies which would address electricity usage from particular sectors, such as subsidies for residential PV systems would only address residential electricity usage.

Carbon Capture and Sequestration: The carbon pricing policies could be expanded from a simple policy that makes use of the barrel tax to one that also provides credits for activities that verifiably sequester carbon. Doing so would require oversight to measure the amount of carbon sequestered. An entity that sequestered carbon would be given a credit equal to the product of the carbon fee and the amount of carbon sequestered. Given some of the difficulties to verify and measure the amount of carbon sequestered, mandates that require better practices, for example in the agriculture sector, could offer a better method. These mandates would be a new standalone policy whereas carbon pricing could include carbon capture and sequestration.

Accelerates Green Jobs & Tech: Since carbon pricing affects emissions throughout the economy, it would accelerate green jobs and green technology throughout the economy and do it where it made the most economic sense.[4] Subsidies and mandates would also effect an increase in green jobs and technology, but it would do so in a more narrowly focused manner and would be picking the sectors where these jobs would be created, which could lead to these jobs not being created where they are most needed. A VMT tax would likely do nothing for green jobs and technology.

Businesses (this metric does not appear in the above table)**:** Carbon fees will increase costs to businesses based on the carbon intensity of their operations. But a great advantage of carbon pricing is that it places no restrictions how a company chooses to reduce its emissions. Unlike mandates, which limit a company's set of options and unlike subsidies and efficiency standards, which pick winners and losers, the carbon fee allows each company to reduce emissions in the most cost-effective manner for it.

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[3] https://www.rff.org/publications/explainers/carbon-pricing-202-pricing-carbon-transportation-sector/
[4] https://www.rff.org/publications/reports/waiting-for-clarity-how-a-price-on-carbon-can-inspire-investment/

Summary: Carbon fee with dividends returned to residents is not the only policy Hawaii needs to reduce its greenhouse gas emissions, but it is the single most effective policy for it addresses all carbon emissions, strengthens other greenhouse gas abatement policies such as the RPS and efficiency standards, financially benefits most low- and moderate-income households (hence promotes climate justice), is progressive, requires virtually no new administrative infrastructure, allows businesses to most cost-effectively reduce their emissions, has proven to be successful in British Columbia[5] (partly leading to all of Canada adopting carbon pricing), and is endorsed by over 3,600 economists.[6]

[5] https://www2.gov.bc.ca/gov/content/environment/climate-change/clean-economy/carbon-tax

[6] https://clcouncil.org/economists-statement/

Par Hawaii

1. Regarding the key value item "Reduce combustion-based electricity generation (including biofuels)", we offer the following comments:
   - While this is a laudable long-term objective, we believe this objective will hinder, rather than help, Hawaii's path to decarbonization. The reason for this is that the electric grid, particularly on Oahu, is heavily reliant on synchronous generators that are powered by liquid fuels. Synchronous generators provide grid stability and firm generation, and this cannot be replicated economically with intermittent renewables (solar and wind) paired with batteries. Therefore, liquid fuels will be an important part of the generation mix for many years, if not decades. We believe that an important part of decarbonizing Hawaii's economy is through fuel switching from petroleum-based fuels to renewable diesel, biodiesel and other fuels that have life-cycle emissions well below fossil fuels.
   - Further, we suggest that the reduction in combustion-based electricity generation should be a secondary consideration, since Hawaii meets the national ambient air quality standards.
   - We believe it is important that Hawaiian Electric is consulted on this item, if they have not already been consulted.

2. We believe there is a significant opportunity to rejuvenate Hawaii's agricultural sector, and reduce wildfire risk, through the production of oil-based crops to be used to produce biofuels for transportation or power generation. The Hawaii Natural Energy Institute of the University of Hawaii has done a substantial amount of work on the feasibility of oil-yielding crops. Additionally, Par Hawaii has entered into a partnership with Pono Pacific, a local land and agricultural management company, to develop oil-yielding crops in Hawaii.

   https://www.hnei.hawaii.edu/
   https://www.parhawaii.com/pono-pacific-forms-partnership-with-par-hawaii/

3. Electrification is unlikely to be a feasible solution for the trucking and aviation sectors in the foreseeable future. Therefore, the decarbonization of transportation and aviation will require liquid biofuels. This will require additional state level incentives such as an expansion of the renewable fuels tax credit and/or a low carbon fuel standard. States on the US West Coast and elsewhere have incentives – ranging from approximately $1-2 per gallon – for low carbon fuels. Fuels will flow to where they can achieve the highest value for producers. Hawaii will need to be competitive with the incentives available in other states in order to attract renewable fuels.

4. Par Hawaii is proceeding with a $90 million project to convert a unit at the Kapolei refinery to the production of renewable diesel and sustainable aviation fuel. This unit will have a capacity of approximately 60 million gallons per year and will begin production of fuel in Q2 of 2025. As noted above, these fuels are expected to be exported to the US West Coast, unless State policy includes financial incentives for those fuels to be consumed in Hawaii.

5. We would encourage research into the potential for geologic sequestration of CO2 in the form of mineralization, similar to the Carbfix project in Iceland. The University of Hawaii is conducting research into the potential for this approach in Hawaii.

   https://www.carbfix.com/