

STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF TRANSPORTATION | KA 'OIHANA ALAKAU
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

Thursday, February 19, 2026

9:45 AM

State Capitol, 325

HB1986, HD1
RELATING TO A CLEAN FUEL STANDARD

House Committee on Energy & Environmental Protection

The Department of Transportation (DOT) supports H.B. 1986, HD1, which requires the Department of Transportation to adopt rules governing a Clean Fuel Standard (CFS) for alternative fuels in the State, thereby taking action to reach Hawai'i's statewide decarbonization and energy security targets established in law.

House Bill 1986, HD1 establishes a framework for reducing the carbon intensity of transportation fuels used statewide by incentivizing the use of lower-carbon and renewable fuel alternatives. A clean fuel standard provides a market-based mechanism to reduce emissions from the transportation sector while decreasing the State's reliance on imported petroleum.

The DOT recognizes the critical role that fuel decarbonization plays in achieving the State's long-term energy security and transportation goals. The DOT's Hawai'i Energy Security and Waste Reduction Plan, published in October 2025, identifies the clean fuel standard as a key tool for reducing transportation-related emissions. The Plan states that "a clean fuel standard is predicted to decrease the carbon intensity of Hawai'i's transportation fuel pool and provide low-carbon and renewable alternatives that would reduce petroleum dependency" (Plan p. 73). Without the timely implementation of additional emission reduction strategies, including clean fuel policies, Hawai'i will not meet its statutory emissions reduction targets.

The DOT's Energy Security and Waste Reduction Plan has three pillars that act as check and balances to develop and prioritize the Plan's strategies: 1) affordability, 2) local energy security, and 3) emissions reduction. The Plan identified a Clean Fuel Standard as a key tool for reducing transportation-related emissions, and the DOT is researching and analyzing the impacts of a CFS on affordability for residents. Key initial findings:

- Hawai'i's fuel use is dominated by liquid fuels, with large opt-in opportunities in aviation and marine. Annual consumption includes about 425 million gallons of gasoline (typically 10% ethanol), 45 million gallons of diesel (about 8% biodiesel

blend), 725 million gallons of aviation fuel, and 55 million gallons of domestic marine fuel. EVs are about 20% of new vehicle sales.

- Supply options exist. Ethanol is fully imported, and biodiesel is locally produced. Renewable Diesel/Sustainable Aviation Fuel (RD/SAF) could grow through domestic production and imports. Electricity CI reduction hinges on grid decarbonization under the RPS.
- Scenario modeling shows substantial CI reductions are achievable, with results sensitive to clean fuel availability.
 - Moderate Scenario: 29% by 2035, 35% by 2040, 50% by 2050.
 - Aggressive Scenario: 20% by 2035, 43% by 2040, 55% by 2050.
- Modeling results indicate that a CFS could increase gasoline and diesel prices by approximately 5 to 14 cents per gallon under the Moderate scenario and 5 to 20 cents per gallon under the Aggressive scenario through 2035, assuming full pass-through of compliance costs. These impacts are primarily driven by credit market conditions and the availability of fuels used for compliance.
- Compliance with a CFS would encourage a broader mix of low carbon transportation fuels, including increased use of electrification as well as opt-in fuels such as sustainable aviation fuel and alternative marine fuels. As next steps, the team will continue to refine the modeling by evaluating additional CFS compliance scenarios and sensitivities, support HDOT's stakeholder engagement on program design and feasibility findings, and assess alternative policy frameworks that could be considered in lieu of a CFS program.

After reviewing the draft initial findings above, and with affordability for residents as one of the three pillars of the Energy Security and Waste Reduction Plan, the DOT is further developing the Moderate scenario and potentially to develop a third Gentle scenario with even greater emphasis on affordability for disadvantaged, rural, and underrepresented communities that may not yet have the option of immediately switching to an electric vehicle or accessing a lower Carbon Intensity fuel.

The initial findings support the Carbon Intensity reduction targets included in the bill language—10% CI reduction by 2035 and 50% CI reduction by 2045, which Gentle, Moderate, and Aggressive scenarios could meet. The initial findings demonstrate that the implementation of a Clean Fuel Standard with the targets in the bill will diversify the transportation fuel market, thereby enhancing energy security, and helping to moderate fuel prices by protecting against the volatility in the global oil market.

The DOT appreciates the amendments included by the House Committee on Transportation. The DOT does not seek an amendment in regard to Section 2(b)(4), but does wish to clarify that we do not plan to include as a credit generating pathway, alternative fuels used to displace gasoline and diesel in "...heating, cooling, and temporary power generation". There is precedent in other clean fuel standard programs for generating credits by using alternative fuels in off-road transportation applications; however, there does not appear to be precedent for credit generation pathways for the use of alternative fuels in heating, cooling, and temporary power generation.

A Hawaii Clean Fuel Standard for the foreseeable future would be a tool to reduce the Carbon Intensity and emissions from transportation fuels only, which may include off-road usage.

The DOT anticipates the need to establish three to five new positions. We propose funding these positions through salary savings from all four DOT modes, ensuring efficient use of existing resources.

Thank you for the opportunity to provide testimony in support.

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA

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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARK

**Testimony of
LEAH LARAMEE
Climate Change Coordinator on behalf of
Climate Change Mitigation and Adaptation Commission
Co-Chair Ryan K. P. Kanaka'ole**

**Before the House Committee on
ENERGY & ENVIRONMENTAL PROTECTION**

**Thursday, February 19, 2026
9:45 AM
State Capitol, Conference Room 325**

**In consideration of
HOUSE BILL 1986 HOUSE DRAFT 1
RELATING TO A CLEAN FUEL STANDARD**

House Bill 1986, House Draft 1 requires the Department of Transportation to adopt rules by 1/1/2028 governing a clean fuel standard for alternative fuels in the State. **The Hawai'i Climate Change Mitigation and Adaptation Commission (Commission) supports this measure.**

The Commission consists of a multi-jurisdictional effort between 20 departments, committees, and counties with the purpose of promoting ambitious, climate-neutral, culturally responsive strategies for climate change adaptation and mitigation.

A State initiated clean fuel standard is recommended by the State's climate plans including the Climate Action Pathways (2025), Energy Security and Waste Reduction Plan (2025) and the Hawai'i Pathways to Decarbonization (2023). It is a necessary tool to support transition to cleaner transportation.

Clean fuel standards provide multiple socioeconomic benefits as well. States that have clean fuel standards policies have reported numerous benefits including cleaner air, reduced carbon pollution, greater investment and research into clean fuels, and economic development and job growth.¹ California, Washington, Oregon and New Mexico have already adopted clean fuel

¹ <https://rmi.org/clean-fuel-standards-the-market-based-policy-for-states-looking-to-clean-up-transportation/>

standards which will help position Hawai'i to be a successful early adopter. Mahalo for the opportunity to comment on this measure.



House Committee on Energy & Environmental Protection
Representative Nicole E. Lowen, Chair
Representative Amy A. Perruso, Vice-Chair

February 19, 2026
9:45 a.m.
Conference Room 325

Thank you for the opportunity to submit testimony in strong support of HB 1986_HD1. My name is Cristina Cornejo and I am the Sr. Public Affairs Manager for Neste, the world's leading producer of sustainable aviation fuel and renewable diesel.

A Clean Fuel Standard (CFS) for Hawaii is an essential policy that will enable the state to meet its decarbonization goals, while reducing air and water pollution from the use of fossil fuels in our transportation system. Similar CFS programs have been implemented in California, Oregon, Washington, and Canada. Most recently, New Mexico enacted a CFS in March 2024 that will begin later this year. In addition, there are currently more than 10 additional states considering CFS policies, due to their effectiveness.

HB 1986_HD1 is NOT a mandate, nor is it a tax credit, but rather it is an incentive program designed to promote the decarbonization of all transportation fuels. CFS policies drive the adoption of lower-carbon transportation technologies, resulting in advanced competition and a diversity of fuel options for consumers. As an example, consumers in California have gone from 2 fuel types (gasoline and diesel) to more than 7 fuel types (gasoline, diesel, renewable diesel, electric, ethanol, biodiesel, hydrogen, and renewable compressed natural gas). This policy also drives substantial new investments in electric vehicle charging and hydrogen infrastructure at no cost to taxpayers.

One crucial element of a CFS is that it is a technology neutral policy that allows consumers to decide what fuels work best for them and their businesses. All transportation fuels can partake in a clean fuels market, and the policy is flexible enough to allow for new technologies that will come online in the future.

Another key component of HB 1986_HD1 is that it utilizes an independent third-party, science-based evaluation for all transportation fuels. The policy uses the GREET model, which was created by Argonne National Laboratory and is the worldwide standard methodology to calculate the carbon intensity of a given fuel. This model assesses fuel on a well-to-wheel basis and considers the full life cycle of a fuel to determine its carbon intensity (CI) score. This ensures that all fuels are scored on an equal playing field, and the winners are those fuels with the lowest possible carbon intensity score. It incentivizes cleaner fuels while letting technologies compete.



In conclusion, a clean fuel standard is the most effective policy in reducing carbon emissions from the transportation sector by incentivizing the production and availability of lower carbon fuels. The State of Hawaii deserves access to cleaner fuels and protection of its treasured natural resources. HB 1986_HD1 is a significant piece of the decarbonization puzzle and we at Neste are proud to support this pivotal policy.

Cristina Cornejo, Sr. Public Affairs Manager, Neste

Phone: (361) 701-9922

Email: cristina.cornejo@neste.com

Neste Background

Neste (NESTE, Nasdaq Helsinki) creates solutions for mitigating climate change and accelerating a shift to a circular economy. The company is the world's leading producer of sustainable aviation fuel (SAF) and renewable diesel, enabling its customers to reduce their greenhouse gas emissions. Neste refines waste, residues and other renewable raw materials to high-quality renewable fuels at its refineries located on three continents. The company's annual renewable fuels production capacity will be increased to 6.8 million tons in 2027.

Neste has high standards for sustainability, and the company has consistently been recognized by several leading sustainability indices.



House Energy & Environmental Protection Committee

February 19, 2026

HB 1986, Relating to a Clean Fuel Standard

Position: Support

The Low Carbon Fuels Coalition is a non-profit trade association that represents the entire value chain of clean fuels industry. Our members include some of the leading companies and organizations that produce, supply and/or represent liquid, gaseous and electric fuels for all transportation sectors including on-road, aviation and marine, as well as large users of these fuels.

The Coalition can attest to the effectiveness of existing similar programs in California, Oregon and Washington, and therefore, supports HB 1986 in Hawaii. Real-world data shows that not only do these programs support greenhouse gas and pollution reductions and promote economic development through private investments, but do so without driving fuel prices.

The data shows no correlation between retail gasoline prices and credit prices, even while the existing programs have exceeded their carbon intensity targets due to the market-based policy design.

Based on the demonstrated success in other states, the Coalition is in strong support of HB 1986.



February 19, 2026

**COMMENTS TO
HB 1986 HD1
RELATING TO A CLEAN FUEL STANDARD**

House Committee on Energy & Environmental Protection
The Honorable Nicole Lowen, Chair
The Honorable Amy Perruso, Vice Chair

Thursday, February 19, 2026, 9:45 a.m.

VIA VIDEOCONFERENCE
Conference Room 325
State Capitol
415 South Beretania Street

Chair Lowen, Vice Chair Perruso, and Members of the Committee,

Island Energy Services, LLC ("IES") offers the following comments on HB 1986 HD1, which proposes the implementation of a Clean Fuel Standard (CFS) for Hawai'i.

The CFS program's flexibility is a key factor in its potential success. By allowing producers to choose how they reduce emissions, whether using renewable fuels or the acquisition of credits—it empowers the market to drive innovation. The program's technology neutral stance further encourages the introduction of new and diverse renewable fuels to the market.

The CFS program treats both local renewable production and renewable fuel imports equitably when considering the carbon intensity. We very much support in-state production of biofuels, however imports will need to be part of the fuel solution to enable Hawaii to meet its long range decarbonization goals and this CFS program allows imports for that to be possible.

Hawaii should be aligning carbon regulations with the other western states and Canada (CA, OR, WA, BC) given its geographic location and market dynamics to create a level commercial playing field. 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 CFS program, Hawai'i will be at a distinct commercial disadvantage to attract renewable fuels.

The CFS program is an equitable way to drive carbon intensity down across end-users. IES believes that CFS programs are a more equitable way to drive carbon intensity down rather than tax-based programs. CFS programs burdens the users of the fuel rather than unfairly burdening the taxpayers of Hawaii.

Given the requirements outlined in the Navahine v. Hawaii Department of Transportation settlement to address climate concerns in the transportation sector, IES believes that fuels for intrastate marine vessels should be included in the program as well. As written, the current bill allows for exemptions for diesel, gasoline, or other fuels used by aircraft, railroad locomotives, military vehicles, and interstate waterborne vessels.

We thank the House Energy & Environmental Protection Committee for hearing this bill and thank you for the opportunity to testify.

Albert D.K. Chee, Jr
Executive Vice President Island Energy Services, LLC



House Committee on Energy and Environmental Protection
Representative Nicole Lowen, Chair
Representative Amy Perruso, Vice Chair

February 19, 2026
9:45 am
Conference Room 325

Pump Cleaner Fuels Hawai‘i is grateful for the opportunity to express strong support for HB 1986 to implement a HI Clean Fuel Standard (CFS). The CFS is a strong, reliable, and proven policy mechanism that addresses fuel emissions while enhancing energy security, resilience, and economic prosperity. HB 1986 represents a pragmatic, actionable plan to decouple emissions from economic growth and feasibly transition Hawai‘i to a renewable economy.

Hawai‘i’s dependence on the transportation sector underscores the critical importance of prioritizing the industry’s economic output and long-term resilience. With current reliance on imports to supply fuels, a CFS will reduce Hawai‘i’s vulnerability to supply chain disruptions, geopolitical uncertainty, and volatile global fuel prices. By slowly requiring reductions in the lifecycle emissions of transportation fuels over time, HB 1986 offers a flexible approach that allows market participants to utilize the most cost-effective strategies to address greenhouse gas emissions.

Clean Fuel Standard–like programs in California, Washington, Oregon, and throughout Canada have created markets where consumers are protected, economic growth is strong, and emissions are declining year over year. States with these policies have benefited from the deployment of electric charging infrastructure, private investment, job creation and protection, and significant public health benefits through reduced air pollution. Hawai‘i has the opportunity to replicate these benefits through the passage and implementation of this program.

HB 1986 aligns with Hawai‘i’s climate and economic goals and utilizes a private market approach rather than a mandate or a tax. For these reasons, I respectfully urge the Committee to pass HB 1986.

Sincerely,

Liat Carlyle



Testimony of
ALASKA AIRLINES and HAWAIIAN AIRLINES

Before the House Committee on
ENERGY & ENVIRONMENTAL PROTECTION

Thursday, February 19, 2026
9:45 A.M.
Hawai'i State Capitol, Room 325

In consideration of
HOUSE BILL 1986, H.D. 1
RELATING TO A CLEAN FUEL STANDARD

The Honorable Nicole Lowen, Chair of the Committee on Energy & Environmental Protection
The Honorable Amy Perruso, Vice-Chair of the Committee on Energy & Environmental Protection
Members of the Committee on Energy & Environmental Protection

Re: Comments Relating to H.B. 1986, H.D. 1, Relating To A Clean Fuel Standard

Chair Lowen, Vice-Chair Perruso, and members of the Committee on Energy & Environmental Protection:

Alaska Airlines and Hawaiian Airlines appreciate the opportunity to provide comments on H.B. 1986, H.D. 1 which would require the Department of Transportation to adopt rules establishing a Clean Fuel Standard for alternative fuels in Hawai'i.

As the largest carriers serving our state, aviation is essential to Hawai'i's economy, connectivity, and daily life. We are committed to decarbonizing our operations, and sustainable aviation fuel (SAF) represents the most viable and scalable pathway to meaningfully reduce aviation emissions in the near and medium term.

Aviation Exemption and Federal Preemption

We strongly support the bill's clear exemption for fuels used by aircraft, as reflected in Section 2(a)(9). Aviation fuel is governed by a comprehensive federal regulatory framework addressing aircraft operations, safety, and fuel standards. Any state-level mandate directly obligating jet fuel under a clean fuel standard would raise significant federal preemption concerns. Maintaining aviation's exempt status is therefore essential to ensure the program remains legally defensible and avoids unintended conflicts with federal law.

Importance of the SAF Opt-In Mechanism

We also strongly support the inclusion of an opt-in mechanism for exempt end-uses, including aviation, to generate credits when using alternative fuels, as provided in Section 2(b)(3).

This structure is critical for SAF. Renewable diesel is more profitable for producers than SAF and already has a structural advantage under clean fuel programs because it directly displaces obligated diesel fuel in the road transportation pool. SAF, by contrast, serves an exempt sector. If SAF were not permitted to opt in and generate credits, that would further widen the gap between renewable diesel and SAF, effectively excluding aviation from participating in the program's benefits. Allowing SAF to opt in ensures aviation can participate in the credit market without creating a legal obligation on jet fuel.

A Clean Fuel Standard Alone Will Not Drive SAF Scale

While the SAF opt-in provision is essential, we respectfully emphasize that a Clean Fuel Standard alone will not be sufficient to incentivize meaningful volumes of SAF in Hawai'i. A CFS is fundamentally a mandate to decarbonize the road fuel pool, and in practice renewable diesel and electric vehicle adoption are likely to be the primary beneficiaries of the program. These technologies directly displace gasoline and diesel in the obligated sectors and therefore generate compliance value more immediately. SAF competes in a different market and does not displace obligated road fuel; its economic viability under a CFS depends heavily on credit values reaching levels sufficient to close the price gap between SAF and conventional jet fuel.

The bill contemplates rulemaking through 2028, with diesel and gasoline compliance beginning in 2029. Based on experience in other jurisdictions, it will likely take several years for the program to mature and for credit values to stabilize at levels high enough to influence significant fuel investment decisions. Additionally, Hawai'i's unique fuel mix presents structural limitations. Road fuels represent a relatively small portion of the overall fuel pool compared to states with larger ground transportation markets. Because credit generation is driven primarily by the road fuel sector, it is not clear that credit values in Hawai'i would rise to levels sufficient to independently incentivize large-scale SAF deployment.

Continued Need for Targeted Hawai'i SAF Incentives

For these reasons, even if a CFS is enacted, targeted Hawai'i SAF tax incentives remain essential over the next decade to drive SAF production, importation, and adoption. A CFS can be an important complementary policy, but in the near and medium term direct, targeted SAF incentives will be necessary to help close the price differential between SAF and conventional jet fuel, provide investment certainty to producers and suppliers, and support the scaling of SAF supply into and within Hawai'i. Without such targeted incentives, SAF risks remaining commercially uncompetitive relative to renewable diesel and other decarbonization pathways supported under the CFS.

Mahalo for the opportunity to provide testimony and comments on this measure.



Committee on Energy and Environmental Protection
Representative Nicole E. Lowen, Chair
Representative Amy A. Perruso, Vice Chair

February 19, 2026
9:45am
Conference Room 325

Aloha Chair Lowen and Vice Chair Perruso:

On behalf of Clean Energy, I would like to express **strong support for HB 1986** which would require the Department of Transportation to adopt rules governing a clean fuel standard for alternative fuels in the state of Hawaii.

Our company was a foundation stakeholder since a CFS was conceived in the respective California, Oregon, New Mexico and Washington processes. Each of these states has been a success and we believe it will be a success in Hawaii as well. As North America's largest provider of renewable natural gas (RNG) transportation fuel with over twenty-nine years of leading industry experience, Clean Energy provides construction, operation and maintenance services for refueling stations nationwide. We have a deep understanding of the growing marketplace, as our portfolio includes over 600 stations in 43 states and we deliver liquified natural gas to Hawaii's utility and built a fuel station in Honolulu.

Already used as a clean, low carbon source of energy around the world, RNG is proven to be a cost-saving alternative fuel to diesel and gasoline. RNG for transportation fuel strengthens our economy with lower fuel costs, increases our energy security, and significantly benefits our environment by reducing carbon emissions and smog-forming NOx emissions by up to 300% and 99%, respectively, relative to diesel fuel.

As we have seen in California, this approach will not significantly raise fuel prices. Recent analyses show that retail fossil fuel prices are strongly influenced by many factors (e.g., global events, holiday weekends, seasonal fluctuations, refinery disruptions and decisions about production that affect supply, refinery pricing decisions, seasonal fuel blends, and taxes) and fossil fuel producer pricing strategies are complex, reflecting local and regional market conditions. **As the California Air Resources Board has noted: "The reality is that the actual cost pass-through from LCFS to retail gasoline or diesel prices is uncertain, that there is no correlation between historical LCFS credit prices and gasoline prices, and that the LCFS is not a major driver of overall retail fuel prices in California."**

The CFS is a cost-effective critical tool not only to effectively meet carbon emission reduction targets, but also as a mechanism that fosters technological innovation, supports a robust market for alternative fuels, provides long-term investment certainty and stimulates job creation and investment.

In addition, the CFS could provide compliance flexibility to producers of high carbon intensity transportation fuels to either invest in low carbon alternative fuels or to purchase credits from low carbon fuel producers. This market-based program enables regulated parties to make their own choice as to whether to invest in low carbon fuels directly or to continue to sell purely high carbon emitting fuels.

For example, California's LCFS is working: it's helping deliver clean air, good jobs and clean energy choices to all Californians and has strengthened the demand for low carbon fuels. California is the fourth-largest economy in the world: we can have clean fuels and grow our economy. The CFS is a powerful tool for supporting the commercialization of the fastest broad-market transitions to clean and low-carbon technologies.

Our company is a prime example of success from clean fuel standards and we look forward to continuing this success in Hawaii. **Please support HB 1986.**

Sincerely,

A handwritten signature in blue ink, appearing to read "Ryan Kenny". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Ryan Kenny
Policy Director – Western U.S.
Clean Energy

Comments before
February 19, 2026 House Committee on
Energy and Environmental Protection

OPPOSING
House Bills 1694, 1695 and 1986
Relating to “Clean Fuels” Subsidies

Mike Ewall, Esq.
Founder & Executive Director
Energy Justice Network
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Aloha Honorable Committee members. Energy Justice Network is a national organization supporting grassroots groups working to transition their communities from polluting and harmful energy and waste management practices to clean energy and zero waste solutions. In Hawai‘i, we’ve been working with residents, members and member groups since our support and involvement was first solicited in 2015.

Please oppose House Bills 1694, 1695, and 1986.

These bills would have the state violate the legal settlement in *Navahine F. v. Hawaii Department of Transportation*. This settlement requires that the State achieve a goal of zero greenhouse gas emissions across all transportation modes within the State, including ground transportation and sea and air interisland transportation no later than 2045. This is not possible if biofuels or waste-based fuels are part of the mix, as they are not carbon free.

Calling it “clean fuel” or “sustainable aviation fuel” (SAF) does not make it clean. There is not enough land and water to grow a significant amount of biofuels in-state. The biotech industry keeps testifying in favor of biofuels bills because they know genetically modified enzymes and crops will be involved, risking biosecurity if grown or processed in-state. It is clear that most of this “clean fuel” will be imported big ag monocrop (mostly GMO) biofuels from the Americas, and that much of what would come from in-state is from toxic waste-to-fuels schemes like Aloha Carbon’s plan to try to gasify construction and demolition waste in Campbell Industrial Park on O‘ahu... using wood that the Hawaii Natural Energy Institute documented to have 200 times as much arsenic as clean wood.

There are no green alternatives for intercontinental flights and these fall outside of the *Navahine F.* settlement scope and the scope of state laws the settlement aims to enforce. Inter-island flights can best be decarbonized by switching to a combination of electric ferries and electric sea-gliders which can be powered by clean electricity sources like wind and solar. There is no need to be building infrastructure for differently dirty fuels that will involve companies that later lobby to prevent the transition to clean options we can start adopting now.

Production will not be local: As was discussed in the 1/29/2025 Joint Hearing on SB 995 before the Senate Energy and Intergovernmental Affairs and Agriculture and Environment Committees, the Department of Agriculture testified to the fact that there simply is not sufficient land or water to have a significant biofuels production industry within the state. This means that most of the production will come from the continent, predominantly the Midwestern states, and from South America, defeating the goal of establishing biofuels as a home-grown industry.

Competition with food: The same Senate hearing exposed how growing crops for biofuels in Hawai‘i would take up land and water needed for the state’s own food security goals to have more food grown in-state.

Genetic engineering: The Biotechnology Industry Organization regularly submits testimony in favor of biofuels bills, yet fails to be transparent about their motivation. Clearly, they expect to have genetically engineered crops and/or enzymes used for the production of supposedly “sustainable” aviation fuels. This raises many

biosecurity concerns, as well as concerns over increased herbicide spraying, since most genetically modified food crops are modified to withstand increased herbicide use.

Toxic waste streams as feedstocks: At least two companies are pursuing goals of producing fuels in the state using contaminated waste streams like construction and demolition waste. This is terribly polluting and even if the toxic metals and dioxins/furans do not end up in the fuel, they'll end up in the air, water, and/or waste byproducts at the in-state production facilities being proposed. More on the toxics concerns below.

Finances: The rather costly fuels are not competitive and are inherently quite expensive. If they were truly clean, one could argue that the expense is worth it, but a state mandate would have to be stacked with multiple federal subsidies to make it remotely feasible. However, those [federal subsidies](#) are vanishing as we speak under the Trump administration and [cannot be expected](#) to carry the day.

Faulty Greenhouse Gas (GHG) accounting: Biofuels look like a climate solution only because of biases in carbon accounting systems and life cycle assessments. There is a long-standing controversy over whether biofuels production uses more energy than it produces. The incredible amount of fossil fuel resources, land, water, fertilizer, chemicals, and other production systems needed to replace fossil fuels is enough to raise the question over whether it even makes sense to replace fossil fuels with biofuels – fuels that, are still carbon based and will still release GHGs when burned.

The incentives would be based on assessing the fuels for their “lifecycle greenhouse gas emissions.” There are many flaws and biases in greenhouse gas (GHG) accounting that cause plant-based (biomass/biofuels) and waste-based feedstocks to be assumed to be “carbon neutral,” even though there is a credible scientific debate over this controversy going for over two decades. Some of the science shows biofuels such as corn-based ethanol to consume more fossil fuels than they displace. The very existence of a debate over this shows that the “net energy” of biofuels are close enough to 1:1 that there can even be a scientific dispute over it. If biofuels require about as much fossil fuel (to grow, process, and transport) as they displace, there is no point subsidizing them and building new infrastructure to support a system that is not really an improvement.

Sustainable Aviation Fuel does not exist: There is no clean or sustainable way to produce a burnable fuel from raw resources and turn it into air pollution when burned. It is inherently not sustainable or circular. There is one approach that comes close to being sustainable or circular, and that is the approach advanced by Feather Fuels and by Twelve Benefit Corporation, one of the companies testifying in favor of “clean fuels” bills. That involves using wind or solar electricity to pull carbon dioxide out of the air, and to also electrolyze water to obtain hydrogen, then use Fischer-Tropsch gas-to-liquids technology to turn the carbon dioxide and hydrogen into a burnable hydrocarbon fuel. This combination of very expensive and energy intensive technologies is rather experimental and has not been done at scale. It could be good to experiment with and prove up as a technology that could make sense in 20 years, but it makes no sense to use clean wind and solar energy on this approach, when wind and solar can decarbonize things much faster and more efficiently if used to replace the burning of oil, biofuels, trash, and trees in the state’s electric grid, and then to eliminate oil and gas in transportation by electrifying that sector. More on this not being the right time below.

Toxicity concerns

Biofuels are impractical and unaffordable to produce in-state. The main efforts to make “sustainable” aviation fuel in the state involve waste-based fuels. There are plans to gasify construction and demolition debris to make burnable aviation fuels on O’ahu. This is part of an array of experimental incinerator-like technologies that aim to convert waste into fuels. These waste-to-fuels (WTF) technologies usually start with pyrolysis or gasification – technologies that, when the resulting gases are burned, are [defined and regulated](#) by EPA as municipal waste combustors (waste incinerators). Typically, these two-stage technologies will replace the second stage (burning the gases) with a liquefaction stage, to make liquid fuels to be burned elsewhere. This is known as Fischer-Tropsch gas-to-liquids technology, named after the two German scientists who developed the ability to make oil from coal by gasifying, then liquefying it.

These are toxic and dangerous technologies that are experimental and often fail both technically and economically. When fuels are burned off-site in land vehicles or for air travel, they are not subject to the sorts of air pollution controls that can be applied to a centralized facility with a single smokestack. Even when such a facility burns the gasified waste on-site with the full complement of air pollution control devices, waste incineration is still [dirtier](#) than burning coal for the climate as well as for most other air pollutants. This is even *with* all four air pollution control systems that waste incinerators should have (note that H-POWER’s two older burners are missing half of these four control systems, though their third burner has all four).

Unlike coal, construction and demolition (C&D) waste is very heterogenous, which can be comprised of steel, concrete, brick, lumber, plaster, empty paint cans, asphalt, wire, shingles, and much more. Pyrolysis and gasification technologies do not work well on heterogenous fuels. They break down constantly and operate only in batches. These finicky technologies require very homogenous fuels. Even those trying to process scrap tires fail repeatedly, because tires are not homogenous enough for pyrolysis. Even the nation’s top cheerleader for tire burning, a spokesperson for the Rubber Manufacturers Association, once stated that “scores of start-ups have tried and failed to make money from tire pyrolysis. The road is littered with the carnage of people who were trying to make this technology viable.”

These technologies have been unable to operate at commercial scale, and typically are garage-scale pilot projects that go nowhere. This trend has led the nation’s leading incinerator-promoting solid waste consulting outfit, GBB, to [classify](#) the technology as “high” risk due to “previous failures at scale, uncertain commercial potential; no operating experience with large-scale operations” (pyrolysis) and “limited operating experience at only small scale; subject to scale-up issues” (gasification).

Hawai’i has been targeted in recent years by quite a few fly-by-night companies aiming to cash in on state and federal subsidies to satisfy the desire for sustainable aviation fuels while making waste streams go “away.” Companies like Aloha Carbon and Yummet prey upon uninformed public officials who don’t have time to research the track record of this industry, the toxic hazards associated with it, or the better alternatives.

Regarding toxic hazards, please see this heavily-cited (92 footnotes) six-page overview I wrote on the [toxic pollution issues associated with construction and demolition \(C&D\) waste incineration](#). While the paper focuses on direct incineration, many of the same principles apply, as the high temperature processes used in WTF technologies still release toxic metals while producing new toxic pollutants such as [dioxins and furans](#), the most toxic chemicals known to science.

C&D waste contains many toxic ingredients. There are chlorine sources in wood treatment chemicals like pentachlorophenol, and in PVC plastics in C&D waste. Painted wood can contain lead and mercury, while

treated wood can contain other toxic metals, namely arsenic, chromium, and copper. [Testimony](#) on House Bill 976 of 2025 from the Hawaii Natural Energy Institute (on pages 43-44 of the testimony packet), affirms high levels of arsenic, chromium and lead in C&D waste, with arsenic concentrations 200 times higher than clean wood. Their research also shows high levels of hydrochloric acid, copper and zinc from C&D waste, but doesn't point out a significant conclusion about this – that numerous [published studies](#) show that copper and zinc serve as catalysts for dioxin formation. [Dioxins](#) are the most toxic chemicals known to science and are formed in processes like those used to make these “sustainable” aviation fuels, where you have hydrocarbons, halogens like chlorine, and medium-high temperatures that are perfect for dioxin formation. These ultratoxic chemicals rapidly bioaccumulate and concentrate in meat and dairy products where 92% of human exposure comes from. Even if these emissions are blown out to sea, they concentrate and come back in the form of seafood.

Not the right time

Prioritizing Conservation and Efficiency

Transportation fuels should first be tackled by prioritizing a reduction in the need for unnecessary travel, then more efficient transportation. After prioritizing these, electrifying transportation is the best solution so that combustible fuels can be avoided entirely. Any system that relies on extraction of resources, burning them up, polluting the air, and having to dispose of wastes is not sustainable. For long-distance flights where electrification may not become possible, perhaps hydrogen has a role, but not until the electric grid is cleaned up and we have *extra* wind and solar available for truly green hydrogen production.

No Such Thing as Transition Fuels

Burnable fuels are not a long-term option, as they are not clean or sustainable, no matter whether they're “biofuels” or waste-based. Any such move is in-between the present and the arrival of clean, non-burn options. Such fuels are often called “transition” fuels. However, the concept of a transition fuel is that we can go from A to B to C, as if B helps us get to C. However, transition fuels have different infrastructure and their own economic weight that causes them to stand in the way of a future transition to clean options.

By the time we finish transitioning the energy sectors that we have clean, non-burn solutions for, long-distance air travel will probably have viable solutions we can focus on to complete the job. However, investments in “differently bad” fuels are an economic investment dead-end, requiring another transition later, wasting time and money needed to do the proper transitions in other energy sectors. In fact, the notion of “transition” fuels is a false one, since it entails investing in infrastructure that could last for 30+ years. No company developing so-called “transition” infrastructure, and trying to amortize their investment, is going to step aside in 5-10 years when something cleaner comes along. They're going to fight to stop the transition to cleaner options to protect their investment. In this sense, it's dangerous to steer resources into false solutions such as waste-based burnable transportation fuels.

Prioritizing the Energy Sectors That Have Clean Alternatives

There are [three sectors of energy consumption](#): electricity, transportation, and heating. Transportation can be broken down into land, sea, and air. Heating is broken down in federal energy reporting as industrial, residential, and commercial/institutional sectors of use.

Just as there are preferable non-burn solutions for every waste management need, there are clean non-burn solutions for nearly every energy sector, though long-distance commercial passenger aviation is not there yet.

Cleaning up these energy sectors should start with solutions we already have, without trying to solve the most unsolvable sector by replacing one type of burnable fuel (petroleum-based aviation fuel) with differently bad burnable fuels (crop-based biofuels) or even more hazardous types of burnable fuels (waste-based fuels).

Since the way to clean up the transportation and heating sectors is to electrify them so that they can run on wind and solar without burning anything, it's critical to clean up the electricity sector first, and faster, since electricity demand will grow as the other energy sectors are electrified. Electricity production is easiest to fully transition to non-burn technologies – mainly solar and wind with energy storage, which are becoming the cheapest options over time. The state's renewable portfolio standard (RPS) aims to transition the electricity sector to "renewable" sources by 2045, but still counts some combustion sources as renewable – the worst of them being solid fuel combustion (burning of trash and trees). [SB 680](#) aimed to clean up the RPS starting by removing solid fuel combustion sources, which will speed up the implementation of solar, wind, and energy storage.

The heating sector is dominated by industrial heating, which is increasingly possible to electrify, while residential and commercial space heating and cooking needs are easily electrified. Electric stoves and heat pumps for space heating can be incentivized.

The transportation sector is easily electrified for land-based travel. International shipping is now possible with [electric ships](#) (see also [here](#) and [here](#)). The hardest sector to make non-burn is long-distance air travel, though inter-island air travel can now be electrified with [sea gliders](#), as Hawaiian Airlines has been exploring.

While waiting for good non-burn solutions to powering long-distance air travel, let's focus where we have good alternatives:

- 1) end combustion in the electricity sector, which is mostly oil in Hawai'i, but also some burning of trash, trees, and biofuels; replace with conservation, efficiency, solar, wind, and energy storage.
- 2) electrify any heating needs... most use is industrial sector, but also help transition residential or commercial sectors where cooking and space heating is done with combustible fuels (mainly gas made from oil).
- 3) end combustion use for land-based vehicles by reducing vehicle use, having better (and fare-free) electrified public transit, and electrifying other land vehicles.
- 4) replace inter-island air travel with electric sea gliders, and electrify shipping, which is now possible.

The 2024 *Navahine F. vs. Hawaii Department of Transportation* settlement requires that the state come up with a plan to reach zero emissions in the transportation sector, which requires doing the same in the electricity sector. This bill would violate that requirement by advancing carbon-based fuels instead of investing in the transition needed in the electricity and (certain) transportation sectors to decarbonize properly and in the right order.

Attached is a resolution adopted by the Democratic Party of Hawaii in 2024 in support of an alternatives study, called for in [SB 2369](#), which would look at non-burn alternatives for the transportation and other energy

sectors. Such a study would be more appropriate and in line with the state's greenhouse gas (GHG) reduction goals and legal requirements.

Also attached are our 8/31/2025 comments on HDOT's Draft Energy Security & Waste Reduction Plan which explain how greenhouse gas accounting for biofuels is gamed and unreliable, how the plan is insufficient in many ways, not to mention unaffordable, and how the plan will be ridiculously expensive and environmentally harmful if relying on burnable "alternative" or "sustainable" fuels.

Democratic Party of Hawai'i Resolution [Adopted](#) May 18, 2024

2024-15: Urging the Hawai'i State Energy Office to Study Non-Burn Alternatives to Combustible Fuels

Whereas, It is important to use Hawai'i state taxpayer funds wisely to create the most good without speculative investments, unnecessary subsidies, or promotion of energy technologies or fuels that conflict with the state's climate change goals, or the peoples' constitutional right to a clean and healthful environment under Article XI, Section 9 of the Hawai'i State Constitution; and

Whereas, Energy consumption sectors tracked by the U.S. Energy Information Administration are electricity, transportation, and industrial, commercial and residential heating; and

Whereas, Technology exists to meet the needs of the electricity sector using conservation, efficiency, solar, wind, and energy storage, which can be made as firm as needed with added storage capacity; and

Whereas, Residential and commercial cooking space and water heating needs are easily electrified with existing technology, including ground- and air-source heat pumps and hybrid electric water heaters; and

Whereas, Industrial heating needs are increasingly possible to meet through a combination of concentrated solar, electricity, and—if necessary—green hydrogen sources from wind and solar; and

Whereas, Land-based transportation, even heavy trucking, can now be fully electrified and powered on clean, non-burn, electricity sources; and

Whereas, Ocean-based transportation is now possible to fully electrify, including international cargo ships with batteries, and some with stationary wind masts; and

Whereas, Interisland air travel is possible with electric sea gliders, as Hawaiian Airlines is exploring, while intercontinental air travel is the one sector that is hardest to convert to clean energy, though Airbus aims to bring to market the world's first hydrogen-powered commercial aircraft by 2035; and

Whereas, Combustible carbon-based fuels release greenhouse gasses as well as other harmful air pollutants, and the production of burnable fuels has many other environmental implications, including the use of land for fuel instead of food, water and soil depletion, spread of genetically modified organisms, and—if using waste streams to make fuel— toxic chemical releases and solid waste byproducts; and

Whereas, Technologies to turn waste into fuels are highly speculative, controversial and polluting, and typically fail to operate at a commercial scale, usually falling apart technically, economically, or both; and

Whereas, Climate impacts of biomass and waste-based biofuels can be close to or greater than those from fossil fuels, especially where trees are cleared to grow bioenergy crops; and

Whereas, Investing in "transition" fuels only builds up an economic interest that makes it harder, politically and economically, to move to the next step where burnable fuels are ultimately replaced; and

Whereas, It is wise to spend public funding first on clean, combustion-free solutions that already exist, focusing on energy sectors where those solutions are not yet fully implemented; therefore be it

Resolved, That the Democratic Party of Hawai'i urges the Hawai'i State Energy Office to conduct a study of the different energy consumption sectors to determine which can be most quickly and cost-effectively decarbonized through additional public investment in combustion-free alternatives; and be it

Ordered, That copies of this resolution shall be transmitted to the offices of the Governor and Lieutenant Governor of the State of Hawai'i, the Hawai'i Chief Energy Officer, and all members of the Hawai'i State Legislature who Democrats.



Comments on HDOT's Draft Energy Security & Waste Reduction Plan

8/31/2025



Aloha HDOT:

We submit these comment to express our concerns over the fiscal and environmental consequences of the Hawai'i Department of Transportation (HDOT) [Draft Energy Security & Waste Reduction Plan](#) (hereinafter "ESWRP"). We urge HDOT staff, consultants and stakeholders, including members of the Hawai'i Youth Transportation Council to read these comments in full, and to spend time digging into the references and footnotes, as there is much to understand about the wide range of false solutions being advanced by this draft plan.

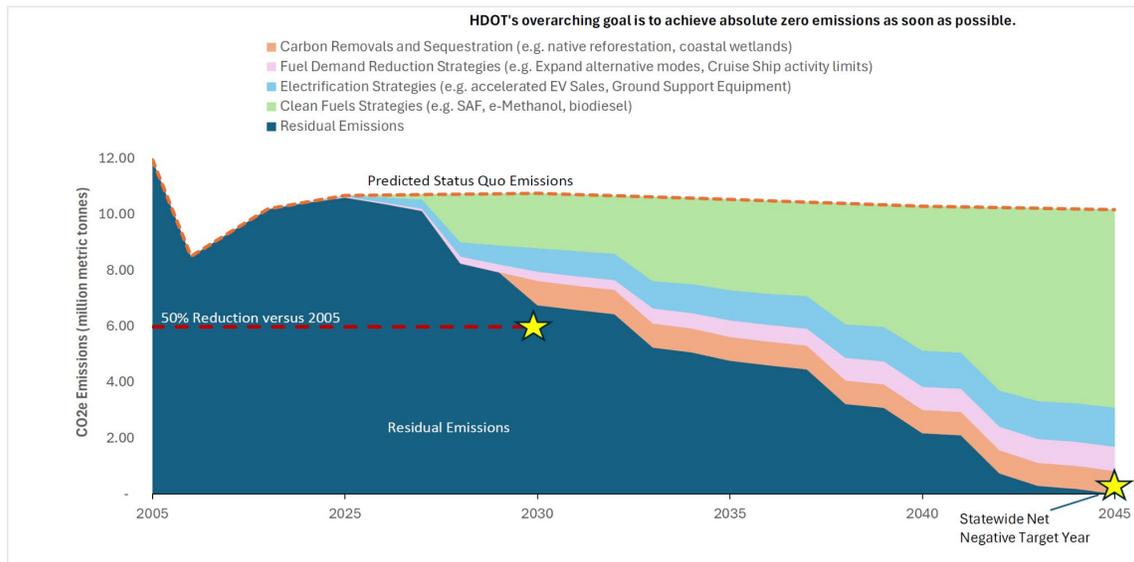
The plan's objective is to meet the goal of zero greenhouse gas (GHG) emissions from the state's "ground transportation and interisland sea and air transportation" systems by 2045, in accordance with state law (HRS § 225P-8)¹ and the *Navahine F. v. Hawai'i Department of Transportation* court settlement.²

Sadly, the plan falls short of this goal and advocates for harmful false solutions and for a "double transition" approach that will be far more expensive than necessary by making two (or three?) major industrial transformations within 20 years instead of one, more thoughtful, transition.

An environmentally-friendly plan should rely on about 40% demand reduction and 60% electrification, which requires that the state's electric grids' capacities be expanded and that combustion-based generation be eliminated.

Instead, as the chart below shows, the plan relies about 70% on burnable "clean fuels" (in green) which are far from clean (some are even worse than the fossil fuels they'd replace), only 14% electrification (light blue), only 8% demand reduction (pink), and the remaining 8% is a shortfall (orange) that HDOT wants to make up with controversial "reductions" elsewhere, in violation of the legal settlement.³ The plan's text states that the shortfall is actually 10%, but the chart in Figure 3-1 shows it to be closer to 8%.⁴

Figure 3-1. Transportation 2045 Net-Negative Emissions Strategy



¹ <https://law.justia.com/codes/hawaii/title-13/chapter-225p/section-225p-8/>

² <https://statecourtreport.org/sites/default/files/2024-07/first-circuit-court-of-hawai-i-joint-stipulation-and-order.pdf>

³ Hawai'i Department of Transportation, "Draft Energy Security & Waste Reduction Plan," (hereinafter "ESWRP") June 27, 2025, p.27, Figure 3-1. <https://hidot.hawaii.gov/wp-content/uploads/2025/06/Draft-ESWRP-6.27.25.pdf>

⁴ ESWRP, page 28 states: "The combined strategies are projected to achieve a 90 percent reduction of baseline emissions in 2045, with the remaining 10 percent reduction coming from hard-to-decarbonize sectors addressed by future carbon removal projects."

Let's not plan to fail

To fulfill legal mandates, the plan must go all the way to zero greenhouse gas emissions by 2045. No plan can guarantee success, but it has to be designed so that it is possible. It's not adequate to start off the plan with this in the first paragraph:

"A sustainable and just intermodal transportation system is one that is ***largely*** powered by clean and locally sourced power, including electricity fueled by renewable energy, ***low-carbon fuels***, and people walking or rolling" (emphasis added).

Furthermore, in the second paragraph of the substance of the plan, on page 14, it states that the plan "aims to lead the state to **net-negative emissions by 2045 and ultimately zero emissions in the transportation sector as soon as possible**" (emphasis added).

"Net" meant "not" (hence the need to meet shortfalls of the mandated zero emissions with reductions outside of the transportation sector), and the "ultimately" (implied to be *after 2045*) reaching zero emissions "as soon as possible," is an admission that this plan aims to push the zero emissions target past 2045, the year mandated in the state law and enforced in the settlement agreement.

Page 90 of the plan states:

"...the reality that currently available SAF [sustainable aviation fuels] has significant remaining lifecycle GHG emissions. Because of these hurdles, despite HDOT's and stakeholders' expected best efforts to reduce GHG emissions, it is anticipated that **achievement of absolute zero GHG emissions will occur after 2045**" (emphasis added).

It is good to see the honesty, but HDOT is still required to have a plan that lands at zero by 2045. As discussed later, this means that sustainable aviation fuels (SAF) must go, as there is not adequate time or money to waste on false solutions that are not zero GHG emissions.

HDOT cannot start off with a plan that expects to miss its mark by 8-10%. Since the "clean" fuels and electricity that make up about another 84% of the plan are not zero GHG emissions sources, the draft plan would miss the mark by far more than 8-10%.

Air travel comprises over half of the GHG emissions this plan aims to reduce. The plan expects 62% of air travel emissions reductions to come from "traditional SAF" by 2045.⁵ SAF is not zero emissions and could easily have greater emissions than the jet fuel currently used. Planning for "traditional" SAF to still be used by the 2045 goal is also not in line with the plan's intention to move from "near-term" biofuels options (synonymous with "traditional SAF") to long-term electrofuel options that supposedly have lower or zero GHGs.

⁵ ESWRP, p.69, Table 3-3.

Avoid greenwashing language

“Clean fuels” and “sustainable aviation fuels” are inappropriate terms. To be more credible and objective, we recommend using “alternative fuels” or “alternative aviation fuels” so that the name itself is not pre-judging that the fuels are clean or sustainable when the plan (in appendix F) even addresses how most of these fuels have downsides that make them not so clean or sustainable.



Similarly, terms like “zero-carbon alternative fuels” (p.18 of the plan) should not be used since nearly every burnable fuel contains carbon and releases it when burned. Fuels that do not contain carbon have other GHG impacts associated with them such as nitrous oxides from burning ammonia, or the indirect effects of leaked hydrogen, which helps methane persist in the atmosphere. When people hear “zero carbon,” it is typically understood to be synonymous with “zero GHG impacts.”

All uses of the words, “clean,” “sustainable,” or “zero” should be searched and reviewed for objectivity. Similarly, assumptions that “renewable” means “clean” or “zero GHG emissions” must be reviewed, as it does not mean that when combustion-based systems are used. The state’s Renewable Portfolio Standard (RPS) law counts as “renewable” the burning of “biomass” (trash, trees and other solid waste and crops), liquid biofuels, and biogas (toxic landfill gases and anaerobic digester gas), none of which are clean or zero-GHG emission, and some of which are worse than the fossil fuels they replace. Nearly half of the energy from the burning of trash comes from fossil fuel sources like plastics made from oil and gas. Even once the 100% renewable electricity by 2045 RPS goal is met, assumptions that this means electricity is GHG-free will be false unless these combustion sources are eliminated from the electric utility’s portfolio.

As the opening of the 2023 Cerology report, “Scrutinising the future role of alternative fuels in delivering aviation decarbonisation” states:

“Readers who are used to the discussion of alternative aviation fuels might have noticed that... we have studiously avoided using a term that has become standard in the industry in recent years – SAF, standing for Sustainable Aviation Fuel. Instead, we prefer to say ‘alternative aviation fuel’.... The reason that we prefer not to use the term SAF is because sustainability is a characteristic of a fuel pathway that is at least somewhat subjective (i.e. it depends on which sustainability criteria are considered important), that may change over time (sustainability can be affected by variables outside the control of a fuel producer such as deforestation rates), and that is at least somewhat scale-dependent – one might feel differently about devoting a couple of farms to bioenergy cropping than devoting half of the agricultural area of Europe.”⁶

The report goes on for two pages on this deliberate use of language, and we encourage HDOT to take it to heart as well.

⁶ Malins, C., Scrutinising the future role of alternative fuels in delivering aviation decarbonisation: Part 3 – the pathway to decarbonised aviation,” October 2023. https://www.aef.org.uk/uploads/2023/11/Cerology_Alternative-fuels-in-aviation_Part-3-decarbonisation_Oct2023-1.pdf#page=10

Discuss public health impacts in a balanced way

It is also important to provide balance and not selectively present only benefits and not harms when discussing energy sources that have both. Page 49 of the plan states: “Biodiesel also significantly lowers sulfur oxide (SOx) and particulate matter (PM) emissions, improving air quality for nearby residents.” There is no mention in the body of the report that other pollutants increase, such as nitrogen oxides (NOx) that trigger asthma attacks and volatile organic compounds (VOCs) that can cause cancer. One must reach into Appendix F on page 150 of the PDF to find out that there could be increased NOx emissions from biodiesel “in some cases” – and no mention of other pollutants that could increase, or of the health consequences of exposure to them.

Putting only benefits up front and burying the harms deep in an appendix is a form of greenwashing and misleads readers. The entire document has only one mention of asthma, one mention of respiratory disease and two mentions of cardiovascular disease (in Appendix F on pages 150 and 152 about biodiesel and renewable diesel). Both of these sentences speak in terms of diseases that would be avoided when these biofuels are burned in place of fossil fuels. However, asthma can be aggravated by increases in NOx from biodiesel burning. While there is a slight admission of the possibility of NOx increasing, there is no corresponding statement that it could aggravate asthma... only that respiratory disease could be alleviated. There are zero mentions of cancer or other public health impacts associated with some of the solutions in the plan.

We expect one-sided discussion of topics from corporations advancing their interests, but not from a public agency that is charged with implementing a plan that should benefit the environment and public health.

“Transition” fuel approach is politically unrealistic and makes high costs more extreme

The plan’s “transition” approach is that it aims to build up a biofuels industry that will lobby against the subsequent transition to electrofuels because private corporations do not want to finance and build 30+ year infrastructure just to tear it down in 10-15 years.

In recent years, there has been a phalanx of lobbyists pressing the state legislature to subsidize “clean fuels” and “sustainable aviation fuels.” This includes airlines, the PAR oil refinery, biorefiners, electric utilities, agribusiness interests, the biotechnology industry trade association, fledgling startups aiming to turn waste streams into fuels, and some nonprofits who are aligned with these interests. Should they succeed and build out this industry to grow, import, and refine biofuels and waste-based fuels, which will take several years just to start up, it would make no sense for them to throw out these investments and tear down all of this infrastructure just to facilitate a transition to “electrofuels” in the latter portion of the 20-year plan period.

It can easily take 5-10 years to get a major new infrastructure project like a biorefinery financed and built. Financing typically involves a 10-20 year investment. The lifetime of the infrastructure can be 20-30 years. No business person will go along with tearing down their investment half-way through its operational life if they can avoid it.

Building up a biofuels industry with the intention to switch gears to an electrofuels industry means that all the economic interests invested in the biofuels buildout will use their profits and political power to lobby against the next transition.

Despite this glaring political problem, the plan aims to make two transitions, if not actually needing a third transition after 2045.

The plan would have state taxpayers subsidize building up “low-GHG” biofuels industries in the short term just to tear them down within 20 years to replace them with other burnable “synthetic” and “electrofuels” that are terribly inefficient and purport to be zero GHG, but are not.

As the table below, from the plan, demonstrates, between 2030 and 2045, the plan would build up, then aim to dismantle 35% of the biodiesel industry, 65% of the ethanol industry, and 72% of the renewable LNG industry – both the supply side, as well as the storage and transportation infrastructure using these fuels unless the same infrastructure can run on the electrofuels that replace them.

Table F-1. Projected Alternative Fuel Demand by Type, Year, and Sector

Fuel Type	Estimated Demand (2030)	Estimated Demand (2045)	Applicable Sectors
Biodiesel	20 million gallons	13 million gallons	Ground (heavy-duty)
Renewable Diesel	19 million gallons	52 million gallons	Ground and Marine
Ethanol	17 million gallons	6 million gallons	Ground (light-duty)
Renewable Gasoline	Not included	Not included	Ground (light-duty)
Renewable LNG	32 million therms	9 million therms	Marine
SAF	410 million gallons	600 million gallons	Aviation
eSAF	No demand in 2030	110 million gallons	Aviation
BECCS SAF	No demand in 2030	36 million gallons	Aviation
e-Methanol	No demand in 2030	58 million gallons	Marine
e-Ammonia	No demand in 2030	62 million kg	Marine
Green Hydrogen	No demand in 2030	1.6 million kg	Marine

Many examples throughout the plan spell out this intent to make at least two transitions:

Page 24: “Develop the infrastructure and supply chain for bio-/renewable diesel and renewable LNG in the short term, enabling intra- and inter-state vessels to transition to these low-carbon fuels, while planning for a long-term shift to alternative clean fuels such as green methanol, green ammonia, or green hydrogen to fully decarbonize marine operations.”

Page 30: Fig 3-3:

2. **Cruise Vessel:** Non-home ported vessels transitioning to bio-LNG near term and e-fuels longer term
3. **Interisland Operation:** 100% biodiesel by 2030, transitioning to e-fuels by 2045.
4. **Inter-state Operation:** 70% bio-LNG by 2030, shifting to e-fuels by 2045.
5. **Assist Tugs :** 100% biodiesel by 2030, moving to zero emissions by 2045.

Page 49: “Clean marine fuels include biofuels (such as biodiesel or renewable diesel), methanol, ammonia, hydrogen, and bio- LNG, each of which has different technological requirements and operational impacts. Renewable biodiesel offers a drop-in solution for existing diesel engines with minimal modifications, making them an attractive early-stage emissions reduction strategy. In

contrast, LNG, methanol, ammonia, and hydrogen, require engine modifications or entirely new vessel builds, making them longer-term solutions.”

Page 49: “For intra-state marine vessels, the recommended transition strategy starts with low-carbon drop-in fuels such as biodiesel and renewable diesel in the near term, with a goal of fully adopting these fuels across intra- state operations by 2030. Beyond 2030, the transition is expected to shift toward e-methanol and e-LNG, with ammonia adoption beginning in 2035 and green hydrogen introduced post-2040. These alternative fuels will require new vessel designs or engine modifications, making their adoption more complex and capital-intensive.”

Page 52: “In the short term (by 2030), efforts should focus on biodiesel infrastructure, followed by LNG, e-methanol, and ammonia bunkering by 2035, and ultimately hydrogen infrastructure post-2040.”

“Given the higher costs of biodiesel, bio-LNG, e-methanol, ammonia, and hydrogen; financial incentives are critical to encourage adoption.” (ESWRP, p.52)

The high costs of these fuels are admitted throughout the plan, more so in the appendices. Requiring two or more transitions will make an expensive plan far more expensive. Alternative aviation fuels being explored are projected to cost about 2-5 times as much as fossil jet fuel, and this approach of making two transitions within two decades will only magnify the costs to taxpayers and consumers.

Most of these “longer-term solutions” are not genuinely zero GHG emission in their burning or lifecycle, which could necessitate a third transition to full electrification with non-burn renewable electricity sources. It would make more sense to go directly to these solutions as soon as they can be made available, and to focus on what is possible on our way there, such as conservation and efficiency strategies, cleaning up and expanding the grid, and electrifying transportation where we can, as soon as we can.

Ensuring Proper GHG Accounting & Modeling

Counting emissions from electricity generation

It is unclear whether and how GHG emissions from the electricity sector will be counted. The plan seems to state it both ways. On one hand, it seems as if they’ll be counted:

Page 80 states:

“This GHG inventory boundary includes the following two sources of indirect emissions:

- Emissions from EV electricity consumption until the electricity grid becomes 100 percent renewable
- Upstream emissions from the production of alternative fuels

The inclusion of emissions from electricity production transportation emissions is one deviation from the statewide DOH inventory approach. Because of the carbon-intensive electrical grid in Hawai’i, it would be disingenuous for this Plan to assume

zero GHG emissions from EVs. Therefore, electricity emissions from EVs and other electric non-road equipment are quantified in this Plan.”

Page B-12 reinforces this: “the baseline emissions projection includes emissions from electricity generation needed to charge EVs. ...electricity grid emissions from EVs and equipment were considered in assessing the impact of electrification on the HDOT emissions inventory.”

As the first bullet above states, emissions will be counted from EV electricity *until* the electric grid becomes 100% renewable. This notion is repeated on page 84, where it states “Emissions from EV electricity consumption will be included in this Plan until the electricity grid becomes 100 percent renewable.”

This assumes that “renewable” energy sources are not releasing GHGs. In fact, trash incineration (like the H-POWER incinerator on O’ahu) releases 65% more GHGs per unit of electricity produced than a coal burning power plant, and nearly half of those emissions are from the burning of fossil fuel-derived plastics. Burning trees, as Mahipapa, LLC does on Kaua’i, and as Hu Honua has been trying to do in Pepeekeo on Hawai’i Island for nearly two decades, releases 50% more GHGs per unit of energy than a coal power plant does. Biofuels and biogas combustion are also not without their own GHG emissions. **“Renewable” does not mean GHG-free. It is imperative that all GHGs are counted, including from “renewable” sources.**

Whether electricity emissions are counted at all seems to be contradicted on page 29, where it states, “EVs are assumed to have zero emissions in transportation,” and on page B-11:

“Exclusions

This Plan is written with the assumption that, for purposes of tracking against net-negative and interim GHG reduction targets, transportation emissions are defined using a similar basis as the DOH GHG Inventory. In that inventory, transportation emissions are limited to the fuels consumed by ground vehicles, aircraft, and watercraft. The following briefly describes excluded sources:

- **Upstream impacts of fuel production**, which are included in the Industrial Process and Product Use (IPPU) sector or **excluded entirely for fuels produced outside Hawai’i**.
- Like fuels, **production of concrete, asphalt and steel** is covered under IPPU or **excluded for materials from outside Hawai’i**.
- **Electricity generation**, which is a portion of the Energy sector” (emphasis added).

Is this last bullet really stating that electricity generation will not be counted, even for EVs, contradicting the prior statements in the plan?

The first bullet also contradicts a statement from page 80, which correctly indicates that upstream impacts of fuel production must be counted, even for the bulk of the biofuels that are imported. Page 80 states:

“The other deviation is the inclusion of upstream emissions from the production of alternative fuels. Clean fuels and other alternative fuels vary widely on lifecycle GHG impacts, and **it is very important that this Plan not incentivize use of alternative fuels with high upstream emissions, assume all clean fuels result**

in zero anthropogenic emissions, or ignore any shift of GHG emissions from Hawai'i tailpipes to international fuel production and processing. Therefore, similar to the approach with electricity, the reduction pathways in Chapter 3 include pro-rated reductions to account for the estimated lifecycle impacts of fuels. For example, a shift of a group of vehicles from petroleum diesel to biodiesel is not illustrated as a 100 percent reduction in emissions in this roadmap” (emphasis added).

Is the use of the term “anthropogenic” implying that “biogenic” emissions can be ignored?

Counting Refrigerants

Page 22 of the plan dismisses refrigerants as negligible:

“HDOT acknowledges that there are other GHG pollutants such as hydrofluorocarbons and perfluorocarbons being emitted as a result of transportation such as leakage from vessel and vehicle air conditioning systems. However, these are outside the boundary of the emissions inventory and are also expected to be quite minimal compared to combustion emissions from aviation, marine, and ground transportation vehicles and equipment, and thus negligible.”

This should be reconsidered in light of the following:

- Older mobile air conditioning systems may not be factory sealed.
- Unlike stationary units, they get jostled a lot, making leaks inevitable. This study on R134a emissions from vehicles may be useful.⁷
- Refrigerants historically have very high global warming potentials (GWP). R134a was the norm in systems and has a high GWP of 1,526 over 100 years (meaning that it is 1,526 times as potent as CO₂ over that time frame), and a GWP of 4,144 over 20-years, which is a more relevant time frame, and the time frame of this policy.
- Most passenger vehicles built in 2025 use R1234yf instead of R134a. R1234yf is an HFO with an ultra-low global warming potential (GWP₁₀₀ is less than 1 in AR6), however larger vehicles and trucks have not all changed over. While the amount of R134a will be decreasing over the years, R1234yf produce trifluoroacetic acid (TFA), a single-chain PFAS, which is of greater concern than its GWP value.⁸ R1234yf completely breaks down into TFA in 7-10 days' time, which means local concentrations of that “forever chemical” will increase. TFA is being regulated in the EU, but I think the U.S. does not yet recognize it as something to worry about.
- DIY vehicle air conditioner recharging is an activity that should be regulated. Discharging a can of R134a into a leaky system will just cause that R134a to be emitted. Since systems don't necessarily need a whole can, people are likely to throw away partial cans, resulting in contents being expelled into the atmosphere. One way of lowering the environmental impact is to require cans of refrigerant to be filled with “reclaimed,” not “virgin,” refrigerant. In Washington State, they have banned the use of all small containers (or DIY) of automotive refrigerants. They did that because the R134a in the cans always left over a little bit, and the collective impact of those heels was significant.

⁷ <https://pubmed.ncbi.nlm.nih.gov/11878368/>

⁸ <https://naturalrefrigerants.com/experts-sound-the-alarm-about-rising-tfa-levels/>

- New York and California have programs relating to refrigerant recovery and recycling.^{9,10} In New York, Part 494 bans the use of small containers of automotive refrigerant containing virgin substances effective January 1, 2027.
- In New York State's 2021 HFC emissions inventory, 15.9% of HFC emissions were from transportation HVAC (which does not include transportation refrigeration). This is more than residential HVAC emissions (10.9%) and commercial HVAC (13.3%), although less than commercial refrigeration (26.8%) and the general category for foams and propellants (29.8%). If Hawaii hasn't done an HFC inventory, the plan should not assume that transportation HVAC emissions are negligible.
- California had a program that charged a \$10 deposit on the DIY cans, but I see [that program has been discontinued](#), in favor of another one, [which pays up to 90% of the cost of professional automotive AC repair](#), for income-eligible residents.

Policies that shift more residents away from DIY cans and toward getting professional help with their automotive AC systems would have long-term benefits. Most shops have a piece of equipment that automatically recovers refrigerant from vehicles, cleans the refrigerant, tests the system for leaks, and recharges the refrigerant (and oil) to precisely the right amount. This is the best practice for long-term vehicle maintenance with environmental benefits for everyone else.

Global warming potentials (GWP)

Page 22 states:

“Using global warming potentials (GWP), emissions from these gases are converted to CO₂e in this report. Only CO₂e values are presented, as they account for all three GHGs in a standardized measure, with CO₂ comprising the largest share of emissions from the included source categories. All GHG emissions are reported in metric tons.”

GWPs are published by the International Panel on Climate Change (IPCC) through large “Assessment Reports” that come out about every seven years. The most recent data is from IPCC’s Sixth Assessment Report (AR6), which was released in 2021. The plan provides GWPs for 20-year and 100-year time frames, where 20-year GWPs are more appropriate if we’re to avoid climate change tipping points.

Is this plan using AR6 20-year GWP values? Will GWPs be updated as the Seventh Assessment Report (AR7) comes out in 2029 and when future reports come out?

The GREET Model: Underestimating Climate Impacts of Biofuels

Page 57 states that “emission factors for these fuels are sourced from the GREET Well-to-Wheel (WTW) Calculator (2022 version).”

“GREET” is the Greenhouse gases, Regulated Emissions, and Energy use in Technologies (GREET) model, a life-cycle analysis tool that calculates the direct greenhouse gas emissions from the production and use of various transportation fuels, such as ethanol and biodiesel.

⁹ <https://dec.ny.gov/sites/default/files/2023-12/part494expressterms2023public.pdf>

¹⁰ <https://ww2.arb.ca.gov/resources/fact-sheets/small-containers-automotive-refrigerant-consumer-requirements>

While mentioned only once in the plan, the use of the GREET model is pivotal, as it is proposed to be used as the measuring tool with which different burnable fuels will be considered to be reducing GHG emissions from the transportation sector.

A deciding factor in whether many biofuels are better or worse for the climate than the fossil fuels they replace is indirect land use change (ILUC). Through GREET, ILUC estimates for crop-based fuels are provided by the Global Trade Analysis Project BIO (GTAP-BIO) model which estimates the area of land converted during biofuel production.¹¹

Leading climate and biofuels experts have written up a scathing and thorough critique of the GTAP model and how it vastly understates the impact of biofuels on climate change by downplaying ILUC. Authors include Yale professor Steven Berry, who has served as a consultant for the California Air Resources Board relating to ILUC from biofuels, and Princeton Senior Research Scholar Timothy Searchinger, who authored some of the landmark critiques of biogenic carbon neutrality assumptions. They write that “GTAP lacks a credible economic foundation” and “is particularly unable to credibly evaluate land use changes.”¹²

In GTAP, “estimated ILUC carbon losses from a gallon of corn ethanol and soybean biodiesel are extremely low, meaning there is little carbon cost for diverting even vast areas of prime farmland to biofuel production.”¹³

“Of thousands of economic parameters, only a small number claim to have any direct, empirical basis. Of these, few of the cited empirical studies make any use of credible techniques for distinguishing correlation from causation and, most fundamentally, supply from demand.”¹⁴

“We also review how additional, empirically unsupported decisions added to the model since the first version used for CARB have further reduced the estimated ILUC. As an example, the model makes a pure assumption, without any supporting economic analysis, that most new cropping area will be supplied not by expansion of cropland but by cropping existing cropland more frequently. This assumption also contradicts actual experience in the U.S.”¹⁵

ILUC, according to these authors, results in emissions that are roughly 3 to 4.5 times the emissions of the fossil fuels that the ethanol or biodiesel is replacing. However, only 10% of these average emissions are accounted for in GTAP’s ILUC estimate used by CARB, and the version used in GREET is even lower. The authors point out that GTAP, as used in GREET, would claim that all the cropland in Iowa can be diverted to biofuel production – or to any other use – with almost no effect on global land use elsewhere and almost no resulting climate consequences.¹⁶

The models incorrectly assume that converting pasture to cropland will not lead to deforestation to replace the pasture.¹⁷

Regarding some of the simplistic assumptions made in the model, they write: “This choice is understandable as a research strategy, but it does not produce a model that can be treated

¹¹ <https://www.epa.gov/system/files/documents/2022-03/biofuel-ghg-model-workshop-gtap-bio-model-2022-03-01.pdf>

¹² Berry, S., Searchinger, T., & Yang, A., “Evaluating the Economic Basis for GTAP and Its Use for Modeling Biofuel Land Use,” Yale Tobin Center for Economic Policy, March 19, 2024. <https://www.energyjustice.net/fuels/gtap.pdf>

¹³ *Id.* at 1.

¹⁴ *Id.* at 2.

¹⁵ *Id.* at 3.

¹⁶ *Id.*

¹⁷ *Id.* at 7.

seriously as a policy tool.”¹⁸ They later point out that GTAP “appear[s] to be picking parameters to fit a narrative.”¹⁹

Their conclusions include the following:

“To summarize, the structure of the economics of the model produces physically impossible results. Even if the economics were reliable, the imposed adjustment factor generates an inconsistent result and lower ILUC.”²⁰

“GTAP is generating results that project the lost carbon from land to generate additional crops for biofuels is only a very small fraction of the average carbon lost to produce these crops in the past. Only with these large reductions in ILUC can a model even project greenhouse gas reductions from these biofuels relative to using fossil shows. By contrast, as shown in Table 1, using this average carbon loss would indicate that crop-based biofuels do not come close to reducing greenhouse gas emissions from transportation over 30 years.”²¹

The ACERT Model

Page 70 of the plan has a sidebar called “Lifecycle Emissions Analysis” (same title as the one mentioning GREET on page 57) that states:

“This emission inventory considers the use of sustainable aviation fuel as a clean fuel. To determine the emission reduction potential of SAF, an emission reduction factor was established by comparing the emission factor SAF to that of kerosene jet fuel (KJF). For example, KJF has a baseline emission reduction factor of 0 percent and SAF has an emission reduction factor between 65 and 80 percent. Conservatively, SAF was assumed to start at 65% reduction in 2028 and scale up reduction by 5% every five years through 2045. Note that these are some of the preliminary reduction factors assumed for this version of the report and they will be further refined in the final version.”

We ask that HDOT please respond to us to let us know what model was used to come up with these assumptions.

Elsewhere on the same page is mention of the “Airport Carbon And Emission Reduction Tool (ACERT)” which is an apparent misnaming of the “Airport Carbon and Emissions Reporting Tool.”²² The ACERT model’s assumption on GHG emissions from biomass for electricity is 26 times lower per kilowatthour than EPA and Energy Information Administration (EIA) data shows. It also assumes that trash incinerator GHG emissions per tonne are 56 times lower and that wood/plant burning emissions per tonne are 108 times lower than EPA and EIA data show. How can we trust this airport industry tool on other metrics when they’re so far off on every input data value we spot checked so far?

¹⁸ *Id.* at 11.

¹⁹ *Id.* at 13.

²⁰ *Id.* at 17.

²¹ *Id.* at 21.

²² <https://store.aci.aero/form/acert/>

In addition, ACERT uses outdated GWPs from 2014 (AR5)²³ when 2021 (AR6)²⁴ is available, and uses the 100-year instead of 20-year GWPs, which is inappropriate considering the policy time frame (2045) being 20 years away and the fact that global warming tipping points (already showing up) aren't about to wait for 100 years. They also choose the more optimistic figures with no climate-carbon feedback which allows them to pluck out the 28 number for methane instead of 34, and 265 instead of 298 for nitrous oxide (N₂O). In fact, if they used the latest science (which was out for two years before the ACERT tool's latest release in 2023), the GWP for methane would be 80-82 (over 20 years), not 28 or 34 (over 100 years).

Finally, some of ACERT's data sources and emissions factors are listed as "Wikipedia," or simply as "Internet." The foundation for GHG accounting in Hawai'i state policy should have a more solid foundation than tools like GREET and ACERT, which are not confidence inspiring!

Making public policy based on deeply flawed models is problematic and results in exaggerated claims of emissions reductions that are illusory, making agencies and politicians look good while we're still cooking the planet and violating legal mandates.

Why burnable fuels are false solutions

All burnable fuels have significant pollution issues, including climate impacts. It is critical to move on from burning things.

The plan includes 10 kinds of burnable fuels. Actually, 11 are listed, but renewable gasoline is not included while all 10 other kinds are part of the plan.

The dominant near-term alternative fuels are corn-based ethanol and soy-based biodiesel that would have to be imported, as Hawai'i has insufficient land and water to produce much in-state.

The U.S. Environmental Protection Agency's website (since before the current administration) states the following:

"Biofuel production and use has drawbacks as well, including land and water resource requirements, air and ground water pollution. Depending on the feedstock and production process, biofuels can emit even more GHGs than some fossil fuels on an energy-equivalent basis."²⁵

There are three major congressionally-mandated reports on biofuels as it relates to the federal Renewable Fuels Standard, the last of which is over 1,000 pages long, backing up these concerns in great detail. We encourage HDOT to at least review the 19-page Compilation of Key Findings (Chapter 17) in "Biofuels and the Environment: Third Triennial Report to Congress," starting on page 856 of the PDF file.²⁶

²³ https://www.climatechange2013.org/images/report/WG1AR5_Chapter08_FINAL.pdf#page=56

²⁴ https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf#page=1034

²⁵ <https://www.epa.gov/risk/biofuels-and-environment>

²⁶ <https://assessments.epa.gov/biofuels/document/&deid=363940>

Counting all the carbon

In addition to the underestimated GHG impacts resulting from indirect land use change (ILUC), there is a tendency to assume that GHG emissions from burning biofuels is simply zero because it's "carbon neutral."

Nearly all of the proposed fuels will still release CO₂ when burned. Assumptions about biogenic carbon neutrality has been repeatedly debunked by climate scientists for over 15 years. It would be good for HDOT to get familiar with these critiques, especially with regard to fuels that involve trees, municipal waste, and construction and demolition waste, where the large time lag between harvesting trees for wood and paper, and the recapture of that CO₂ by newly growing trees, is so long that there is no real "carbon neutrality" in a meaningful time frame.

"Biogenic" CO₂ comes from the burning of paper, food scraps, yard waste, wood, leather, and other materials that ultimately grew from soil. Biogenic carbon dioxide emissions are real CO₂ molecules that warm the atmosphere just like any CO₂ molecule released from the burning of plastics and other materials made from fossil fuels.

A majority of the CO₂ emissions from trash incinerators like H-POWER get erased in most GHG reporting due to outdated assumptions that "biogenic" carbon should not be counted. It is important to recognize that even if HDOT will not look at the science challenging biogenic carbon neutrality assumptions, the fossil fraction of trash-derived fuel must be recognized as fossil, even though the state Renewable Portfolio Standard law brands it "renewable."

The carbon neutrality assumption comes from the notion that this carbon should not be counted because trees and plants regrow, and that this carbon is simply recirculating in the biosphere, as opposed to being "new" carbon in the biosphere that was extracted from underground in the form of coal, oil, or gas.

However, carbon (CO₂ or methane) in the air causes global warming, while carbon in a plant or tree does not. We cannot simply pretend that carbon in a tree is the same as carbon in the air. Carbon in a plant or tree does not warm the climate until burned (or slowly decayed).

This biomass carbon neutrality notion has been debunked by climate scientists since at least 2009. There are two main reasons: double counting, and the time lag problem.

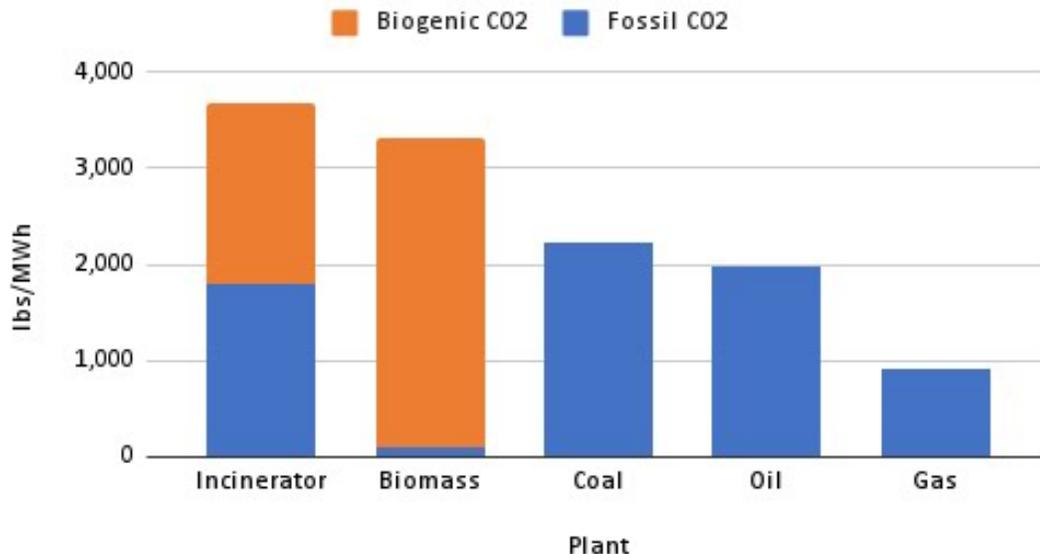
Carbon absorbed by growing plants is already factored into global climate models. The reason why it became a practice not to count carbon emissions in certain sectors was, *when looking at all sectors together*, to avoid double counting when assuming carbon is released when trees are cut down, then counting it again if those trees are burned. However, when looking just at one sector, such as vehicle emissions, it is improper to subtract biogenic carbon as if it has not already been accounted for elsewhere. This becomes an accounting problem.²⁷

Should HDOT subtract GHG emissions because of plants and trees that already grew? [This would be the double counting error.] ...or to subtract emissions from plants and trees that they presume will grow later? [This would be speculative, and there is not always a guarantee of trees or crops being replanted, as the Hu Honua court case demonstrated. And then there is the time lag problem...]

²⁷ Searchinger, T. D., Hamburg, S. P., Melillo, J., Chameides, W., Havlik, P., Kammen, D. M., et al. (2009). "Fixing a Critical Climate Accounting Error," *Science*, 326(5952), 527-528. <https://doi.org/10.1126/science.1178797>

Burning trees for electrical power releases 50% more CO₂ per unit of energy than burning coal. Burning trash for power releases 65% more CO₂ per unit of energy than burning coal. The following data is from EPA's Greenhouse Gas Reporting Program:

Incinerators emit 65% more CO₂ than coal



Growing trees do not instantly reabsorb this extra pulse of carbon. As the Manomet Center for Conservation Sciences documented when studying the issue for the Commonwealth of Massachusetts, it takes newly growing trees around 40-70 years to take up enough carbon to make it equivalent to burning coal.²⁸ This is not carbon neutrality, but just absorbing that extra CO₂ so that it's as bad as coal burning after several decades. Carbon neutrality would take centuries and is never quite reached, even if trees were replanted and not cut down in that time frame (or burned up in wildfires on a warming planet).

In trying to avoid critical global warming tipping points, we do not have several decades to wait for trees to suck up extra carbon released by burning trash or trees. This carbon must be counted, not discounted as if there's a free pass to release that CO₂ because a slow carbon cycle will eventually suck it back up.

Ironically, it is better for the climate to burn coal and plant trees than to burn trees and plant trees. We are not recommending either. However, this CO₂-only metric shows the absurdity of allowing biogenic carbon to be offset in this manner.

Burning trash and planting trees (which incinerator corporations are not doing, anyway) often allows the incinerator industry to subtract their emissions. However, if a gas-burning power plant planted trees, that rightfully would not count against their emissions.

²⁸ Thomas Walker, et. al., "Biomass Sustainability and Carbon Policy Study," Manomet Center for Conservation Sciences Report to the Commonwealth of Massachusetts Department of Energy Resources, June 2010 (Report NCI-2010-03). <https://www.mass.gov/doc/manometbiomassreportfullhirezpdf/download> Executive Summary available at: https://www.manomet.org/wp-content/uploads/2018/03/Manomet_Biomass_Report_ExecutiveSummary_June2010.pdf

For further background on biogenic carbon accounting, see these footnotes cited here.^{29,30,31,32} We ask that these footnoted references, in full, be considered part of our comments by reference and are to be made part of the decision-making docket.

Feedstocks

A wide variety of feedstocks exist to make burnable fuels. Every one of them has its own significant problems, many of them rivalling fossil fuels, and all of them just “differently bad.” This includes liquefying and/or gasifying or otherwise cleaning, converting or processing municipal solid waste,³³ sewage sludge,³⁴ construction and demolition waste,³⁵ animal wastes,³⁶ trees,³⁷ purpose-grown crops,³⁸ crop wastes,³⁹ vegetable oils,⁴⁰ anaerobic digester gas,⁴¹ landfill gas,⁴² algae,⁴³ and even “thin air” and water with electrofuels that involve direct air capture⁴⁴ and “green” hydrogen.⁴⁵

Much has been written on these topics, and we cannot reasonably provide a full exploration of them all in these comments, but please include all of these footnoted reports and the sources within them as part of our comments, as there is much to read and know about each. Please also review our 6-page comments on Senate Bill 1120 here: https://www.capitol.hawaii.gov/sessions/session2025/Testimony/HCR70_HD1_TESTIMONY_TRN_04-01-25_.PDF#page=9

On biofuels generally, please review the excellent reports by Biofuelwatch at: <https://www.biofuelwatch.org.uk/category/reports/general-overview/> and <https://www.biofuelwatch.org.uk/category/reports/biofuels-liquid/>

Also, the reports by Aviation Environment Federation: <https://www.aef.org.uk/category/reports-briefings/>

Most critically, on aviation fuel, please read this report in full: https://www.aef.org.uk/uploads/2023/11/Cerology_Alternative-fuels-in-aviation_Part-3-decarbonisation_Oct2023-1.pdf

²⁹ Biomass Incineration and Climate. <https://energyjustice.net/biomass/climate>

³⁰ Energy Justice Network comments on EPA WARM Model. https://downloads.regulations.gov/EPA-HQ-OLEM-2023-0451-0112/attachment_1.pdf

³¹ Partnership for Policy Integrity comments on EPA WARM Model. https://downloads.regulations.gov/EPA-HQ-OLEM-2023-0451-0112/attachment_7.pdf

³² Landfill Gas <https://energyjustice.net/lfg/> and the articles and links referenced at the top and under “related links,” specifically this report: <https://www.sierraclub.org/sites/www.sierraclub.org/files/landfill-gas-report.pdf>

³³ <http://www.energyjustice.net/incineration>, on waste pyrolysis, see pages 3-7 and the reports footnoted within these recent comments: <https://www.energyjustice.net/ny/Sullivan2025RFPCComments.pdf>

³⁴ <https://sewagesludgeactionnetwork.com>; <http://www.ejnet.org/sludge>

³⁵ <https://energyjustice.net/waste/cd/>; <https://energyjustice.net/incineration/cd.pdf>

³⁶ <https://energyjustice.net/poultrylitter/>

³⁷ <https://energyjustice.net/biomass/>; <https://energyjustice.net/biomass/woodybiomass.pdf>; <https://energyjustice.net/hi/huhonua.pdf>

³⁸ <https://energyjustice.net/ethanol/ethanol-factsheet.pdf>; <https://energyjustice.net/biodiesel/biodiesel-factsheet.pdf>

³⁹ https://energyjustice.net/ethanol/cellulosic/factsheet_cellulosic.pdf (covers cellulosic ethanol generally)

⁴⁰ <https://www.biofuelwatch.org.uk/2025/fat-grab-report/>

⁴¹ <http://www.energyjustice.net/digesters>; <https://zwia.org/composting-and-anaerobic-digestion-policy/>;

https://www.foodandwaterwatch.org/wp-content/uploads/2024/01/RB_2401_LCFS_Methane.pdf; https://foodandwaterwatch.org/wp-content/uploads/2021/04/ib_1611_manure-digesters-web.pdf; <https://www.foodandwaterwatch.org/2024/01/09/the-big-oil-and-big-ag-ponzi-scheme-factory-farm-biogas/>

⁴² <http://www.energyjustice.net/lfg>

⁴³ <https://www.biofuelwatch.org.uk/docs/Microalgae-Biofuels-Myths-and-Risks-FINAL.pdf>;

<https://www.biofuelwatch.org.uk/category/reports/biofuels-liquid/cellulosic-algal-biofuels/>;

<https://www.thenation.com/article/environment/exxon-algae-biofuels/>;

<https://web.archive.org/web/20230323143637/https://www.greentechmedia.com/articles/read/lessons-from-the-great-algae-biofuel-bubble>; <https://www.canarymedia.com/articles/climate-tech-finance/stop-trying-to-make-algae-biofuels-happen>

⁴⁴ https://www.foodandwaterwatch.org/wp-content/uploads/2023/01/FSW_2212_DirectAirCapture.pdf

⁴⁵ <https://www.energyjustice.net/hydrogen/>

As these articles and reports document, in addition to climate change impacts, there are also many other harmful impacts that will come in the form of toxic releases, genetically modified crops and microorganisms, water and soil depletion, chemical use, land use, food insecurity, and – since most of this cannot be produced in-state – a heavy reliance on importing these fuels even while aiming to be energy independent and secure.

Relating to Hawai'i having sufficient land or water to grow biofuels vs. the need to import most of them, as well as concerns relating to whether taxpayers or airline customers should foot the bill for subsidizing these biofuels, we encourage all to watch the 35-minute hearing on Senate Bill 995 of 2025, pertaining to "Sustainable Aviation Fuel Import Tax Credit; Renewable Fuels Production Tax Credit."⁴⁶ Senator DeCoite calls up staff from the state Department of Agriculture who make it clear that there is not sufficient land or water available for this purpose. Other testimonies during this hearing are quite eye opening. You can view it here: <https://www.youtube.com/live/eLQmyLuHOu8?feature=shared&t=283>

As page 51 of the plan admits, most of the envisioned fuels do not exist and are not low-GHG at this point where they do exist:

"While Hawai'i is committed to transitioning marine operations to low- or zero-carbon fuels such as green hydrogen, methanol, and advanced biofuels, many of these alternatives are not yet commercially viable, lack supporting infrastructure in the state, or currently carry high lifecycle carbon intensities due to existing production methods."

This reality is not likely to change for biofuels, though electrofuels (horribly expensive and inefficient at this time) will get cleaner over time as the electric grid gradually shifts to clean, renewable sources.

Food vs. Fuel; Imports

Page 2 of the plan states "we must decrease our dependence on imported energy and food." The plan also acknowledges the problem on page F-7 where it states: "But if virgin oils such as palm or soybean oil are used extensively, it can create tension with food supply and raise concerns about deforestation and agricultural expansion."

This is a great reason not to grow biofuels in-state.

Hawai'i is dependent on importing about 80-90% of its energy and 80-90% of its food. Using precious land to grow fuel for vehicles necessarily means making the state even more food insecure. As the Department of Agriculture [testimony](#) showed on SB 995 of 2025, there is next to no land or water available to grow fuels in the state, requiring that nearly all reliance on biofuels will mean shipping it in from the continent. The answer is not to grow or import biofuels, but to electrify with local (non-burn) renewable energy production.

Biotechnology

The biotechnology industry's trade association routinely testifies in favor of biofuels bills in the state legislature. Their testimonies never state why they are so supportive of biofuels, but it is obvious to anyone who knows enough about the industry. The main biofuels currently in

⁴⁶ https://www.capitol.hawaii.gov/session/measure_indiv.aspx?billtype=SB&billnumber=995&year=2025

production are corn-based ethanol and soy-based biodiesel. As of 2024, 94% of corn grown in the U.S. is grown with genetically modified organisms (GMOs) and 96% of the soy is GMO.⁴⁷ This is primarily to withstand higher doses of herbicides, which leads to more herbicide spraying, mainly with Bayer (formerly Monsanto) product, Roundup (glyphosate), which is the subject of many lawsuits now that it is shown that it's not as safe as table salt, and indeed causes cancer. These herbicides have also been tied to harming amphibians, including deformities in frogs born with extra legs and such. There are other food and biofuel crops and trees that industry has been working to make GMO varieties of for many years, which could also be on the horizon for biofuel production in Hawai'i. Read more on the impacts of ethanol and biodiesel production in our factsheets linked in footnote 38.

As living organisms, GMO crops don't always stay where they are planted. There is a history of them contaminating nearby farms of organic farmers, for example. Since the GMO crops are patented intellectual property, there is a brutal history of Monsanto suing farmers whose farms were contaminated with their seed, as if the farmer was stealing the company's property.

Far more disturbing, however, is the biotech industry's other main motivation for supporting biofuels bills. They have long been experimenting with genetic modification of bacteria, algae and enzymes. Algae biofuels have been explored extensively, and have been a huge failure, whether genetically modified or not. Please review the reports in footnote 43 for details. Enzymes have been a part of efforts to make cellulosic ethanol viable... an industry that aims to convert everything from corn husks to pizza boxes to trash into liquid fuels. This industry has also been riddled with failed attempts for 2-3 decades. Genetically modifying bacteria is also linked to biofuels production. Given how impossible it is to contain microbes, and how quickly they can reproduce, having unnatural versions of microbes out in the wild could have unintended and disastrous consequences.⁴⁸

A European company has developed a GMO variety of *Klebsiella planticola* (KP), one of the most common bacteria on the planet, designing it to make alcohol out of plant matter. The idea was to make use of wheat straw, stalks and leaves. A researcher at University of Oregon tested it to see if it could survive in the wild, and found that it readily killed the plant in his experiment while the non-GMO variety did not.⁴⁹ If microbes like this were to be able to survive in the wild, the ecological consequences could be unthinkable.

Waste-based fuels

Some companies are pushing to use gasification or pyrolysis technologies to make burnable fuels from trash, construction and demolition (C&D) debris, and other waste streams. This is toxic and polluting, quite expensive, and has not worked at commercial scale. Please see our comments on the Maui Aloha Aina Project that seeks to turn trash into fuels to barge to O'ahu.⁵⁰ As we discuss in our testimonies on "clean fuels" bills,⁵¹ the toxic hazards associated with pyrolysis or gasification of C&D waste are serious, especially where wood treated with copper, chromium and

⁴⁷ <https://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-united-states>;
<https://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-united-states/recent-trends-in-ge-adoption>

⁴⁸ Szyjka, S. et al. (2017). Evaluation of phenotype stability and ecological risk of a genetically engineered alga in an open pond production. *Algal Research*, 24. <http://www.sciencedirect.com/science/article/pii/S2211926417300024>

⁴⁹ <https://www.sciencedirect.com/science/article/abs/pii/S0929139398001292> (bypass paywall [here](#)); See also:
<https://www.gmwatch.org/en/latest-listing/1-news-items/8951-full-story-of-the-dr-elaine-ingham-controversy-over-klebsiella-p>;
<https://www.saynotogmos.org/klebsiella.html>;
<https://web.archive.org/web/20071219095433/http://www.purefood.org/ge/klebsiella.cfm>

⁵⁰ The project is described here: https://files.hawaii.gov/dbedt/erp/Doc_Library/2025-06-23-MA-DEA-Maui-Aloha-Aina-Project.pdf and our comments on this Environmental Assessment are here: <https://www.energyjustice.net/hi/MauiWTFcomments.pdf>

⁵¹ https://www.capitol.hawaii.gov/sessions/session2025/Testimony/HCR70_HD1_TESTIMONY_TRN_04-01-25_.PDF#page=9

arsenic is present. For example, Aloha Carbon's plan to try to gasify C&D waste in Campbell Industrial Park on O'ahu would inevitably involve handling treated wood which the Hawaii Natural Energy Institute documented to have 200 times as much arsenic as clean wood.⁵²

Green Hydrogen

Half of the ten fuel pathways involve "green hydrogen" (SAF, eSAF, e-Methanol, e-Ammonia, and green hydrogen itself). Hydrogen is typically extracted from fossil gas, but can come from other hydrocarbons. Green hydrogen involves electrolyzing water to split it with renewable energy into hydrogen and oxygen, which recombine when used in a fuel cell or burned.

Green hydrogen production is very inefficient, and will never be truly "green" until there is excess wind or solar on the grid. Until then, wasting 50-80% of the clean wind or solar energy in the process of splitting water and using the hydrogen fuel makes no sense because it would be better to use that clean energy to displace oil directly on the grid instead of displacing a much smaller amount of oil in a vehicle.

The plan ought to be careful not to over-claim, such as stating that there is no associated carbon emissions from production of green hydrogen if made from renewable sources. After all, burning trash, trees, and other sorts of biomass, biofuels or biogas are all renewable, and all have significant carbon emissions.

There are many other issues with hydrogen. Please review the top articles linked from our <https://www.energyjustice.net/hydrogen> page for good overviews. Also, newer evidence shows that hydrogen can be an indirect greenhouse gas when it inevitably leaks (it's tiny and hard to contain and can embrittle steel pipe).⁵³

Long-distance aviation and some industrial heating applications are the only sectors that may need green hydrogen, and both are outside of the scope of this settlement. Prematurely allowing "green" hydrogen in the plan just means more oil burning to make up for the electricity wasted making hydrogen.

Electrofuels

Direct air capture is another inefficient and wasteful scheme some aim to combine with other energy-wasting ideas (green hydrogen) to make "sustainable aviation fuel" which is specifically promoted in the settlement. Like green hydrogen, it makes no sense to use before the electric grid is 100% powered by non-combustion renewable energy sources and has extra wind and solar to spare. Doing so would release about as much or more CO₂ than it would capture, either directly by using oil-fired power, or indirectly by using up renewables that could be displacing oil-fired power.

⁵² See pages 2-3 in their testimony here:

https://www.capitol.hawaii.gov/sessions/session2025/Testimony/HB976_TESTIMONY_EEP_01-28-25_PDF#page=42

⁵³ <https://www.canarymedia.com/articles/enn/scientists-warn-a-poorly-managed-hydrogen-rush-could-make-climate-change-worse;>
[https://www.dnv.com/article/is-hydrogen-a-greenhouse-gas--243214/;](https://www.dnv.com/article/is-hydrogen-a-greenhouse-gas--243214/) <https://www.cleanegroup.org/initiatives/hydrogen/areas-of-concern/>

Leaky pipelines

Transportation of hydrogen and methane in existing, leaky gas pipelines risks ongoing GHG releases and should not be allowed.

Electrify

In order to get away from burning things, we need to electrify the transportation sector, and ensure there are zero greenhouse gases from the electricity sector. (The transportation sector cannot become zero emission if it relies on an electricity sector that is still powered, in part, by GHG-emitting combustion sources.) Currently, the state's combustion sources of electricity generation are 66% from oil-burning, plus another 4% from "renewable" burning of trash, trees, and biofuels... all of which need to be eliminated to reach a zero GHG emissions target.

It is not enough to rely on the state's Renewable Portfolio Standard, which requires 100% "renewable" electricity by 2045, since this law includes the burning of "biomass" (trash, trees and other solid waste and crops), liquid biofuels, and biogas (toxic landfill gases and anaerobic digester gas). These fuels have carbon emissions worse than fossil fuels. Several corporations are aiming to expand use of these "bio" fuels, which will undermine the state's climate goals. The state's Renewable Portfolio Standard (RPS) law must be fixed to remove combustion so that these fuels no longer qualify.

It is possible to electrify ground transportation, and sea and air interisland transportation, while decarbonizing the electricity sector, in a clean way that focuses on conservation, efficiency, solar, wind, and energy storage. This can be done reliably, more cheaply, and with fewer environmental impacts than the false solutions in the draft plan.

HECO is 64.2% oil generation and 3.3% waste/biofuels as of 2024. Clean (non-combustion) renewable electricity must displace this 67.5% combustion power before wasting energy on "green hydrogen" or electrofuels for planes. Otherwise, you're keeping the grid dirtier and contributing to more GHGs.

HDOT's plan should focus on ensuring an adequate supply of clean electricity by speeding up the process of cleaning up the electric grid while expanding clean renewable generation.

As the chart on the next page demonstrates, it's far more efficient to displace coal or gas power on the grid (oil would be in between those two) than to use clean energy to make hydrogen or jet fuel.⁵⁴

⁵⁴ See page 24 in https://www.aef.org.uk/uploads/2023/11/Cerology_Alternative-fuels-in-aviation_Part-3-decarbonisation_Oct2023-1.pdf

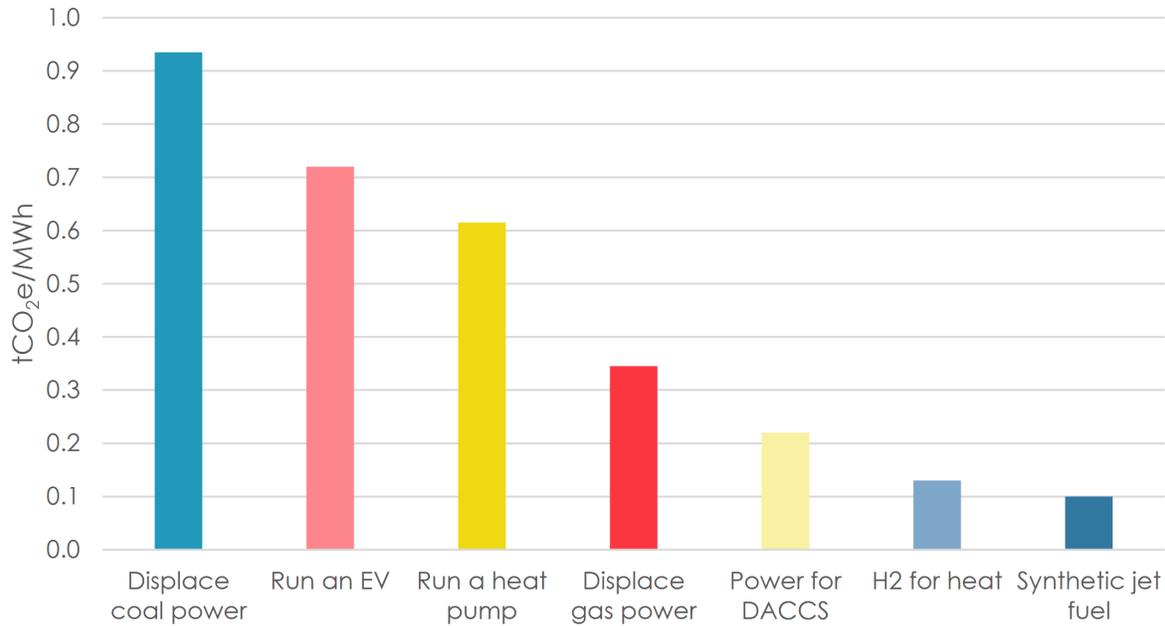


Figure 4 Emission avoidance with 1 MWh of zero carbon electricity in example applications

Clearly, cars and small trucks can be electrified. Heavy trucking, planes and boats are the areas that are less common. However, aside from long-distance air travel, all the rest can be electrified today, and the technology exists.

The plan says, on page 24, that “EVs may not meet the operational needs for some heavy-duty truck applications.” This is outdated information. There are now EV trash trucks and long-haul trucks long enough to do any land distance in Hawai‘i. The longest likely heavy truck trip possible in the state would probably be a trash truck going as much as 130 miles for the longest routes to the West Hawaii Sanitary Landfill from the east side of Hawaii Island. EV semi trucks have ranges of 150-500 miles as of this 2023 article.⁵⁵ Specific to trash trucks, Waste Today Magazine writes: “Designed for commercial and residential refuse collection, the Model 520EV can handle up to 1,100 trash bins on a single charge.”⁵⁶

Avoiding Fraud / Double-Counting

There are plenty of ways to game the system, and not enough safeguards in place. With a state mandate for 100% “renewable” electricity by 2045 and a concurring mandate for zero GHG emissions from the transportation sector by 2045, it could be attractive to allow the same “renewable” electricity (which could be burning trash or trees or could be real renewables like wind and solar) to serve both at the same time. However, this is generally considered double-counting and some states and regional grids have protections against that sort of fraud. HDOT ought to work with the PUC and legislature to ensure that there is no double counting of electrons

⁵⁵ <https://www.eesi.org/papers/view/fact-sheet-the-future-of-the-trucking-industry-electric-semi-trucks-2023>

⁵⁶ <https://www.wastetodaymagazine.com/news/peterbilt-delivers-ev-trucks-to-waste-connections-of-new-york/>

or emissions attributes when developing any parallel mandate that will inevitably draw on renewable electricity to some degree.⁵⁷

Reduce demand

Demand reduction in both the electricity and transportation sectors must be a priority to help make it reasonable for both sectors to be clean and renewable by 2045. Conservation and efficiency strategies to reduce electricity waste would reduce the amount of new clean renewable energy generation capacity and storage that needs to be added to the grid in order to have enough excess clean electricity to power vehicles.

The Elephant in the Air; Stay within the Scope

According to the pie chart on page 15 of the plan, 53% of the greenhouse gases from the state's transportation sector are from air travel. How much of that 53% is from flights to other U.S. states? HDOT is only required by HRS § 225P-8 and the *Navahine F.* settlement agreement to address interisland air transportation (but not military aviation, nor flights to and from Hawaii).

On page B-11, it states “[p]er the settlement agreement, international marine and aviation activities are not included in the calculations and strategies identified in this Plan, which is also consistent with the DOH GHG Inventory.” Note that it's not just international aviation, but interstate aviation is also excluded. The only marine or air travel that is in the scope is that which is within the state. This is not the time to broaden the scope, making a hard task even harder. Get this right, then once 2045 rolls around, perhaps there will be better options for long-distance air travel. Long-distance container shipping already has electrification piloted, but that's not for HDOT to worry about yet!

Solving local air travel

Interisland air travel can be electrified through a combination of electric-powered ferries and seaglidors, as the Hawaiian Seaglider Initiative is exploring with the major airlines.⁵⁸

Granted, seaglidors are fairly new, but they now exist and are being tested out. The Regent Seaglider⁵⁹ seats 12 people so far, which is 12-15 times fewer than the planes typically used. Hawaiian Airlines uses a Boeing 717 (128 passengers) and Southwest uses a Boeing 737 MAX8 (175 passengers).

To make this possible without congestion, there can be more departure and landing points. HDOT should be working to plan out infrastructure for this as part of this plan.

Also, since many of the flights are surely for tourists, there are many who may not be in such a rush and might opt for a ferry between islands, which would be slower, but likely cheaper. It would allow for whale and dolphin watching and will reduce the numbers who have to be in planes. Prior controversies over the Super Ferry can hopefully be avoided. After all, plenty of cruise ships and

⁵⁷ See discussion of double-counting here: <https://www.aef.org.uk/2025/08/05/double-counting-risks-in-saf-global-supply-chain/>

⁵⁸ <https://www.hawaiiseaglider.org/april-press-release>

⁵⁹ <https://www.regentcraft.com/seaglidors/viceroy>; see also <https://www.youtube.com/watch?v=ggK0vlqiSV4>, <https://www.youtube.com/watch?v=QVMesBgdOLQ>, and https://www.youtube.com/watch?v=s-GP_0Cud98

cargo ships already go between the islands. Some passenger ships shouldn't make a major difference.

Page 58 contains the plan's only mention of Electric Aircraft, which is a case study of a 3-passenger electric plane for "travel across the island of Maui." This may make sense for emergency medical transportation if electrifying a helicopter doesn't make more sense, but "enable faster and more frequent travel across the island of Maui" should not be a goal as it's simply increasing transportation use, and to what end? Let people drive an EV or take an electric bus. Electric aircraft are needed to get between islands, and the current electric options (sea gliders) can do 12 passengers, four times more than this case study. Why is that not featured in the plan instead?

Dangerous "Carbon Removal" Schemes

Instead of trying to reach zero GHG emissions, as legally required, the plan assumes HDOT will fall short by 8-10%, and aims to make up for this with projects that purport to reduce emissions elsewhere.

Plans to burn trees and other organic material (biochar, BECCS) are also harmful and toxic, and carbon capture and storage technologies do not capture 100% of their CO2 emissions. Biochar (mentioned on page C-3) is an incineration technology (pyrolysis) that is toxic and problematic.⁶⁰

Plans to filter seawater with membranes to remove CO2 would impact any other sea life that is caught up in the process.

"Enhanced rock weathering" would risk spreading metals into the environment while disturbing natural features.

Injecting CO2 into concrete can leak out over time.

Recycling plastic waste into roads (mentioned on page 33) is adding many toxic chemicals to asphalt, making it far more toxic than asphalt already is with the introduction of additives (catalysts, stabilizers, color pigments), PFAS and more.⁶¹

While not directly mentioned, several sections "pave" the way for Honolulu's plan to recycle toxic H-POWER trash incinerator ash into roads, which would spread toxic chemicals throughout our environment. While there is great controversy in O'ahu over the building of a new (double-lined) landfill over the aquifer, the City and County of Honolulu is pursuing plans to take the same waste (the toxic ash from the H-POWER trash incinerator) and build roads with it over the island. These would be linear unlined landfills, exposing people and the environment to dioxins and toxic metals in the ash. However, this will likely be framed as a strategy for "low carbon concrete."⁶² In New York state, the state with the most trash incinerators (ten of them), the toxic chemical content of their incinerator ash is high enough that if placed on the land, it would meet the soil cleanup standards and would be required to be cleaned up.⁶³

⁶⁰ <https://energyjustice.net/incineration/biochar.pdf>; <https://www.biofuelwatch.org.uk/wp-content/uploads/Biochar-briefing-2024.pdf>; <https://www.biofuelwatch.org.uk/category/reports/biochar/>

⁶¹ <https://pmc.ncbi.nlm.nih.gov/articles/PMC12347778/>

⁶² For info on incinerator ash testing, safety and "recycling," see https://www.capitol.hawaii.gov/sessions/session2025/Testimony/SB438_HD2_TESTIMONY_JHA_04-02-25_PDF#page=45 or pages 9-12 here starting half-way through page 9: <https://www.energyjustice.net/ny/Sullivan2025RFPCComments.pdf>

⁶³ <https://www.energyjustice.net/incineration/ashvssoilcleanup.pdf>

The last 8% is a violation of state law and the legal settlement, as it represents GHG emissions that will continue, but are to be compensated by supposed reductions elsewhere.

Policy solutions / Legal authority

Page 3 states: “Establish a market-based mechanism to incentivize the use of clean marine fuels and discourage the use of fossil fuels.” In policy-making, avoid “market-based mechanisms” like carbon fees since they are not guaranteed to be strong enough or specific enough to meet a target. HDOT will not get to zero with policies like “discourage” rather than “ban.”

Page 36 states: “If every new vehicle sold in Hawai‘i was an EV starting in 2030, some gasoline vehicles could remain on the road in 2045.” If the legal authority exists to actually meet the goal of zero, then make this goal mandatory. Also, if it’s close enough to zero, will there really be gas stations left to service the rare people left with gasoline vehicles?

Page 3: “Increase the use of electric vehicles (EVs) statewide by expanding public charging infrastructure, converting transit vehicles to electric, and providing financial incentives for EV adoption.” Can the state set emissions standards? Can it ban sales of gasoline or diesel vehicles?

Page 56 discusses curtailing cruise ships. Will this run into interstate Commerce Clause challenges, or does the state really have the power to mandate it? It would be unrealistic to rely on cruise companies to voluntarily curtail their business.

There are discussions on pages 59 and F-16 on why the state cannot mandate SAF. If that’s the case, then what indirect ways can the state get people out of planes and into the seaglidors and ferries that can be fully electrified? Build it, and making it cheaper, more flexible, and attractive and they will come?

There are several areas in the plan that seem to have been written as if Trump is not president and as if the “One Big Beautiful Bill” had not passed. This includes page 35 where it says that “current federal regulations will spur increasing sales of EVs,” and page 41 where it talks about “securing federal grants” for electric fleets, page 84 where it says HDOT has applied for and received a Clean Materials Grant (is this secured or vulnerable to Trump admin cuts?). Page B-12 also talks about EPA CAFE standards. Were these not recently gutted?

Public Involvement

Page 61 mentions that “HDOT will lead a statewide coalition of airlines, fuel producers, farmers, NGOs, and government agencies to build a shared roadmap for producing, importing, and using sustainable aviation fuel (SAF) in Hawai‘i.” This is mostly the fox in charge of the henhouse. Before involving all of these economic interests, how about revisiting whether SAF makes sense and whether HDOT plans to tackle interstate air travel, even though it’s beyond the scope of the state law and settlement agreement?

There must be more knowledgeable people with critical views involved in the inner circle as this work continues. The small circle of agency staff, industry interests, plaintiffs and youth have clearly not been sufficient to prevent this draft plan from being a laundry list of false solutions.

Page 61 states that in September 2025, a “first coalition meeting” will be held. Will these meetings be open to the public? Please answer this in time for us to participate.

Page 77 states “This strategy represents HDOT’s chosen approach to implement the strategies in this Plan. It is already underway with HDOT engaging key stakeholders to consult on this Plan prior to its release, and regularly communicating and collaborating with Earthjustice, Our Children’s Trust, and Hawai’i Youth Transportation Council.” Please regularly communicate with us as well. Being on the outside trying to look in has not been productive or collaborative.

Page 91 states: “HDOT plans to update the plan annually for the first 5 years after the issuance of the first plan. This will allow for additional analysis as needed, integration of new technologies as they become available, and will reflect progress made by HDOT.”

It’s good to see this. How do we become an integral part of the process rather than a once-per-year opportunity to comment on something already drafted?

Errata

- Page 16: “four general aviation airports” should say five?
- Fig 3-4: “overacrching” and “aagressive”
- Pages 8 & 70: “Airport Carbon And Emission Reduction Tool” should be “Airport Carbon and Emissions **Reporting** Tool”
- Page F-13: “the climate benefit of renewable LNG hinge” - need ‘s’ on benefit or hinge

Conclusion

There are many ideas in the HDOT plan that are decent and just need to be scaled up, especially every method to electrify transportation. Public transportation needs to be ramped up a lot, and be fare-free. Trash, recycling and composting collection should be one hauler going to all homes for curbside collection so that we don’t have people doing separate trips to transfer stations in the neighbor islands. Efforts to grow more food (not fuel!) on the islands will increase food security while reducing shipping. Let’s make this all happen... the right way, in the right order, without more combustion, please!

Mahalo nui loa,

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**Hawaii House of Representatives Committee on Transportation
HB1986 - Relating to Clean Fuel Standard | Stakeholders' feedback**

This comment is intended to recommend the use of the Carbon-14 testing method to determine the share of biogenic carbon content of sustainable aviation fuels (SAF) produced from co-processing, MSW and biogas under Hawaii’s HB1986. Biogenic content measurements following methods such as ASTM D6866 Method B currently provide critical value to existing state, federal and international clean fuel standard programs.

Included here you will find:

Recommendations for Renewable energy – revising biofuel, bioliquid and biomass fuel production pathway values and modifying methodology	1
What is Biogenic Testing (Carbon-14)?	6
ASTM D6866 Method B - The Most Reliable Method	6
About Beta Analytic	7
ISO/IEC 17025:2017 laboratory	8
Required tracer-free facility for Carbon-14	8
References	9

Recommendations

We recommend that Hawaii’s HB 1986 and 1694 bills to create a sustainable aviation fuel production tax credit **should include direct biogenic content testing (Carbon-14) requirements following the ASTM D6866 Method B standard for any fuels or feedstocks seeking recognition of renewable (biogenic) content.** Routine direct biogenic testing requirements are the only reliable method of incentivising the use of biomass-derived content while guaranteeing compliance, and currently play a critical role in prominent similar programs. Several fraud cases in Europe highlighted the need to implement strict requirements when incentivising the use of biofuels, and we urge the House committee to review ongoing fraud concerns in Europe and implement mandatory testing to avoid fraud risks. SAF have the potential to play a significant role in decarbonising and ensuring fuel security for Hawaii, and safeguards must be put in place to ensure tax credits are properly issued.

Implement Routine Biogenic Testing Requirements

Our first recommendation is that Hawaii should rely on routine biogenic testing requirements in line with those in place for the US RFS, California's LCFS, Oregon's CFP and Washington's CFS for the proposed SAD credit in HB 1986. Introducing routine testing would also be in line with best practices established by Canada's CFR and the EU's RED.

Routine direct test results are currently used to verify biogenic content under the US EPA's [Renewable Fuel Standard \(RFS\)](#), California's [Low Carbon Fuel Standard \(LCFS\)](#), Oregon's [Clean Fuels Program](#), Washington's [Clean Fuel Standard \(CFS\)](#), Canada's [Clean Fuel Regulations \(CFR\)](#) and the EU's [Renewable Energy Directive \(RED\)](#). All of these programs, except the EU RED, specifically require the Carbon-14 standard ASTM D6866, while the EU RED accepts ASTM D6866 or its European equivalents. ASTM D6866 is also required for prominent third-party verification programs, most notably the Roundtable on Sustainable Biomaterials (RSB). **Testing requirements allow clean fuel programs to exclusively incentivise the renewable portion of fuels.** This is especially important given the recent history of attempted fraud in existing transportation fuel decarbonization programs.

Hawaii's proposed SAF credit should require direct biogenic testing for any fuels produced from co-processing, municipal solid waste (MSW) biogas & renewable natural gas (RNG) and any other fuels for which the final biogenic content is unknown. Current requirements of routine direct testing following ASTM D6866 under similar prominent programs include (please see specific rules hyperlinked):

- The US RFS currently [requires](#) routine direct testing following ASTM D6866 for fuels produced from co-processing, municipal solid waste (MSW), [biogas and renewable natural gas \(RNG\)](#).² - California's LCFS [requires](#) routine direct testing for fuels produced from co-processing and recommends it for fuels produced from MSW.
- Oregon's CFP [requires](#) routine direct testing following the protocols of the US RFS third-party engineering reviews.
- Washington's CFS [requires](#) routine direct testing following the protocols of the US RFS third-party engineering reviews.
- Canada's CFR [requires](#) routine direct testing for any fuels produced from co-processing and their co-products.
- British Columbia's LCFS [requires](#) monthly testing for any fuels produced from co-processing and quarterly testing for their co-products, as well as to verify biogenic feedstocks.
- The EU's RED [requires](#) routine direct testing for any fuels produced from co-processing or biogas and renewable natural gas (RNG).

Always Require Calculations to be Verified by Direct Testing

Beta believes it is not in the best interest of Hawaii's proposed SAF credit to allow any mass balance

calculations to be used for reporting biogenic content under this program. If Hawaii does allow any mass balance calculations, it is critically important to require these calculations to be verified by routine direct testing. We stress the importance of reviewing other programs' experiences with these calculation-based approaches to understand the risk they would introduce to the program.

Producers and industry lobbying groups favour calculation-based approaches such as mass balance because they enable facilities to make claims solely based on material inputs in production. These calculations allow producers to assume that all of their biomass inputs end up in their facilities' outputs, despite it being well understood in the industry that the input of renewable feedstocks is not the same as the output because performance varies, and renewable feedstocks don't produce the same quantity of material as their fossil counterparts. By basing their calculations solely on production inputs rather than outputs, these methods systematically over-report the renewable share of fuels.

Calculation-based approaches also use a system of free allocation, meaning they do not have to guarantee that there is any renewable content in a given fuel. Producers prefer this because if 10% of their feedstocks are biogenic, they can claim that 10% of their products are biogenic, even if that's not the case, because biobased can go in different amounts to different products in the co-process. Even further, book and claim also allows them to claim that 10% of their products are 100% biogenic and the rest are 0%, even if all of the products should be 10% biogenic based on calculations (and would likely C14 test below that).¹⁰

These calculations' reliance on free allocation creates the potential for double-counting of renewable content, leaving low-carbon fuel programs susceptible to a high risk of greenwashing and fraud. For example, this threat is highlighted by the recent mass balance fraud challenges faced by the ISCC regarding fraudulent biodiesel submissions from China, which "caused a dramatic fall in biodiesel prices in European markets" in July 2023. In response to this situation, the EU quickly updated the RED's co-processing rules to uniformly require direct testing, including verifying the calculations of producers choosing to use calculation-based approaches.

The importance of limiting the role of mass balance for reporting the biogenic content of fuels is articulated very well by a [recent judgement](#) of the Advocate General of the EU Court of Justice (CJEU) on the roles of mass balance and C-14 for reporting biogenic content in co-processing. The official opinion found that mass balance calculations are not intended to quantify the share of biogenic carbon contained in a biofuel produced by co-processing. This judgment was issued in response to a case brought by BP France against the French government regarding a tax incentive requiring C-14 testing to verify claims of renewable content. BP is also a board member of the ISCC.

Recently, in the US, issues with mass balance in the recycling industry have received increasing attention. A [ProPublica investigation published in June 2024](#) found that products advertised as 30% recycled

through mass balance often contained less than 1% recycled content. Similar concerns were shown by the US EPA as early as 2023, which described the mass-balance methodology as deceptive and advised against promoting it. In August 2024, the US Environmental Protection Agency (EPA) launched a federal action against the mass-balance methodology used in the recycling sector.

In September 2024, California Attorney General Rob Bonta filed [a lawsuit against ExxonMobil](#) claiming that the oil major “deceptively” promoted chemical recycling as a solution to the plastic crisis, citing their use of mass balance calculations such as ISCC Plus. That lawsuit directly challenges the standard’s use of ISCC’s free allocation method as a system designed to enable greenwashing. The New York Times also recently [published a relevant article](#) on the challenges that mass balance presents to the recycling industry, which aligns with the challenges experienced in the renewable products industry.

It is in the best interest of Hawaii’s decarbonization goals not to allow any producers to report their biogenic content using mass balance calculations. However, if mass balance is used at all, these calculations must be routinely verified by direct testing. The advantage of the updated RED protocol is that producers can choose to use calculations internally, while the program still ensures the information reported is accurate through direct Carbon-14 analysis. This is the only way to mitigate the risk to the program introduced by these calculations.

Require Routine Testing for Co-Processing in Refineries

As discussed above, refineries conducting co-processing are required to verify the renewable portion of their fuels under the US RFS, California’s LCFS, Oregon’s CFP, Washington’s CFS, Canada’s CFR and the EU RED. We re-emphasise the importance of the EU RED as a relevant example, which allowed co-processed fuels to be submitted exclusively using calculations and was forced to quickly adopt C-14 testing requirements after discovering a massive case of fraudulent fuels in 2023.

In addition to the regulations for other programs linked above in the, “Introduce Routine Biogenic Testing Requirements” section, we also urge Hawaii’s legislature to review the following studies on co-processing conducted by the ASTM D02 Committee on petroleum products, liquid fuels and lubricants. We specifically recommend reviewing RR:D02-2052, which compares the results of ¹⁴C and mass balance in co-processing facilities. The table below shows an example of that study’s key findings.



Standard	Report #					
D1655	RRD02-2052					
Findings						
Pre-Fractionation Blend Analysis						
	Component, vol %	Blend 1 Pre	Blend 2 Pre	Blend 3Pre		
	Petrochemical Stream	60	80	80		<i>This Pre-Fractionation verification of biogenic content of the blends demonstrates the accuracy of ASTM D6866</i>
	Feed 1	40				
	Feed 2		20			
	Feed 3			20		
	D6866 Method B	40	20	20		
Biogenic %, per ASTM D6866 Method B	Blend 1 Pre	Blend 1 Post	Blend 2 Pre	Blend 2 Post	Blend 3 Pre	Blend 3 Post
	40	17	20	7	20	5
Standard	Report #					
D1655	RRD02-1886					
Findings						
Biomass Input 5%, yield in final product by ASTM D6866 2.1%						

The black font in the table shows the expected values of biogenic content based on mass balance calculations, while the red shows the actual values reported by direct testing. The study shows that mass balance consistently over-estimated the biogenic content which ended up in co-processed fuels because biomass does not behave the same as fossil feedstocks, and not all of the biomass inputs necessarily end up in the same output.

We recommend further reviewing RR:D02-2052, as well as the rest of this collection of technical reports which includes RR:D02-1886, RR:D02-1929, RR:D02-2052, RR:D02-1739, RR:D02-1810, RR:D02-1776, RR:D02-1884, RR:D02-1828, and RR:D02-2039. Several of these studies specifically compare the results of ¹⁴C and mass balance in co-processing facilities in the context of sustainable aviation fuel production in particular. These studies found that mass balance calculations are consistently unable to estimate the renewable portion of co-processed fuels and should not be relied on as the sole method of verification for clean fuel programs. All of these technical reports are available from ASTM upon request.

Require Testing for Any Biomethane Book-and-Claim

As the biomethane industry accelerates in jurisdictions with clean or low-carbon fuel programs, properly regulating the industry in this early stage is key to its future success. Recent developments in the US RFS and EU RED have demonstrated best practices for regulating biogas, biomethane and renewable natural gas (RNG) based on these programs' early experiences with these fuels. Recently, biogas to SAF has gained traction as a potential pathway, highlighted by Syzygy Plasmonics [recently signing](#) a six-year offtake agreement to produce SAF from biogas.²⁰

The only way to reliably differentiate biogenic biomethane from fossil fuel methane is to require mandatory routine test results following ASTM D6866 Method B for any entities seeking recognition of emission reductions from the use of biomethane. Since biomethane and fossil fuel methane are chemically identical molecules, the only way to differentiate the two is to perform Carbon-14 testing of the fuels or the emissions after combustion to assess what percentage of the mixture was biogenic.

The EU introduced biogenic testing requirements for fuels produced from biogas in a June 2023 update to the EU Renewable Energy Directive (RED) titled, [“Renewable energy- method for calculating the share of renewables in the case of co-processing.”](#)¹ This update was specifically issued in response to the discovery of a major case of fraud within the RED program stemming from biodiesel submissions from China, which were approved by mass balance calculations. The EU investigation into this issue is still ongoing, and the full extent of the damage is not yet known, but this was a significant setback for the program and quickly plummeted biodiesel prices in the EU. The EU tied biogas and RNG into the update in order to address these concerns for any fuels containing a mixture of biogenic and fossil content.

The advantage of this framework is that the EU was able to continue to accept calculation-based methodologies like mass and energy balance by requiring routine direct biogenic testing to validate the data. However, calculation-based approaches are much more common for co-processing, where all inputs and outputs are concentrated in a single facility, as opposed to biomethane and RNG, which are often produced, upgraded and blended at multiple facilities. The US introduced biogenic testing requirements for fuels produced from biogas in the 2023 Set Rule update to the US Renewable Fuel Standard (RFS), in a section called the [Biogas Regulatory Reform Rule](#).² This update requires routine biogenic testing for any biogas or RNG fuels seeking to generate RINs under the RFS. Starting on July 1st, 2024, for new facilities and January 1st, 2025, for existing facilities, fuels produced from biogas will need to submit biogenic test results of the biogas at the point of production from the digester/landfill, at the point of upgrading, and after upgrading, prior to pipeline injection.

Beta encourages Hawaii to consider following a similar approach to enable a book-and-claim system for biomethane using routine direct testing. The US RFS model of testing at the point of production, at the point of blending with non-renewable components and at the point of injection into a pipeline, provides a comprehensive chain of custody for the renewable content in these fuels, making it possible to report and trade only real biogenic content introduced to the grid. Similarly, the EU RED model demonstrates that tying calculation-based accounting approaches to routine direct testing is the most secure way to access the benefits of a book-and-claim system without exposing the program to undue risk.

¹ 2023. “Renewable energy- method for calculating the share of renewables in the case of co-processing.” *European Commission* ²² 2023. “ISCC Press Release July 27, 2023.” *International Sustainability & Carbon* Page 6

² 2023. “40 CFR Parts 80 and 1090– Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes.” *EPA*

Conclusion

Establishing this sustainable aviation fuel credit would be a critical step forward in Hawaii's decarbonization journey. By implementing best practices for verification established by similar state, federal and international fuel decarbonization programs, Hawaii can best prepare this program to successfully achieve and measure its goals. Routine direct testing following ASTM D6866 Method B is the most effective way to incentivise and validate biogenic content under this program.

What is Biogenic Testing (Carbon-14)?

Carbon-14 analysis is a reliable method used to distinguish the percentage of biobased carbon content in a given material. The radioactive isotope carbon-14 is present in all living organisms and recently expired material, whereas any fossil-based material that is more than 50,000 years old does not contain any carbon-14 content. Since Carbon-14 is radioactive, the amount of carbon-14 present in a given sample begins to gradually decay after the death of an organism until there is no carbon-14 left. Therefore, a radiocarbon dating laboratory can use carbon-14 analysis to quantify the carbon-14 content present in a sample, determining whether the sample is biomass-based, fossil fuel-derived, or a combination.

The analysis is based on standards such as ASTM D6866 and its international equivalents developed for specific end uses, such as ISO 13833. ASTM D6866 is an international standard developed for measuring the biobased carbon content of solid, liquid, and gaseous samples using radiocarbon dating.³ There are also many international standards based on the specific use of direct Carbon-14 testing, such as ISO 13833, which is an international standard developed for measuring the biogenic carbon content of stationary sources' emissions.⁴

Carbon-14 analysis yields a result reported as % biobased carbon content. If the result is 100% biobased carbon, this indicates that the sample tested is completely sourced from biomass material, such as plant or animal byproducts. A result of 0% biobased carbon means a sample is only fossil fuel-derived. A sample that is a mix of both biomass sources and fossil fuel sources will yield a result that ranges between 0% and 100% biobased carbon content. Carbon-14 testing has been incorporated into several regulations as the recommended or required method to quantify the biobased content of a given material.

ASTM D6866 Method B - The Most Reliable Method

³ 2021. "Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis." *ASTM International (D6866-21)*

⁴ 2013. "ISO 13833:2013 Stationary source emissions: Determination of the ratio of biomass (biogenic) and fossil-derived carbon dioxide." *International Organization for Standardization*

Carbon-14 is a very well-established method which has been in use by many industries (including the fossil fuel industry) and academic researchers for several decades.

Carbon-14 measurements done by commercial third-party testing is robust, consistent, and with quantifiable accuracy/precision of the carbon-14 amount under **the ASTM D6866 method B**. The EN 16785 is the only standard that allows a variant of the Mass Balance (MB) method of 'carbon counting' under EN 16785-2. The EN 16785-1 requires that the biocarbon fraction be determined by the carbon-14 method. However, when incorporating this EN 16785 method, certification schemes like the "Single European Bio-based Content Certification" **only** allow the use of EN 16785-1 due to its reliability and the value of a third-party certification. <http://www.biobasedcontent.eu/en/about-us/>

In ASTM D6866 method B, the carbon-14 result is provided as a single numerical result of carbon-14 activity, with a graphical representation that is easily understood by regulators, policy makers, corporate officers, and, more importantly, the public. The overwhelming advantage of carbon-14 is that it is an independent and standardised laboratory measurement of any carbon-containing substance that produces highly accurate and precise values. In that regard, it can stand alone as a quantitative indicator of the presence of biobased vs. petroleum feedstocks. When carbon-14 test results are challenged, samples can be rapidly remeasured to verify the original reported values (unlike mass balance).

The quantification of the biobased content of a given product can be as low as 0.1% to 0.5% (1 relative standard deviation – RSD) based on Instrumental error for Method B (AMS). This error is exclusive of indeterminate sources of error in the origin of the biobased content and manufacturing processes. As such a total error of +/-3% (absolute) has been assigned to the reported Biobased Content to account for determinate and indeterminate factors.⁵

It is also important that the program should always require ASTM D6866 Method B, rather than allow Method C for any use. Where ASTM D6866 Method B uses the AMS Instrument to measure ¹⁴C, Method C uses Liquid Scintillation Counting (LSC). In Method B, the AMS Instrument directly measures the ¹⁴C isotopes. However, in Method C, scintillation molecules indirectly absorb the beta molecules that are released with the decay of ¹⁴C and convert the energy into photons, which are measured proportionally to the amount of ¹⁴C in the sample. Since Method B directly measures the ¹⁴C isotopes and Method C measures them indirectly, Method B is significantly more precise and should be prioritised in regulations.⁶ LSC measurements, like those used in Method C, are commonly used as an internal testing tool when samples are limited and accuracy does not need to be extremely high.

⁵2021. Standard Test Methods for Determining the Biobased Content of Solid, Liquid, and Gaseous Samples Using Radiocarbon Analysis. *ASTM International (D6866-21)*. pp 1-19. doi: 10.1520/D6866-21.

⁶2022. "Testing the methods for determination of radiocarbon content in liquid fuels in the Gliwice Radiocarbon and Mass Spectrometry Laboratory." *Radiocarbon*



ISO/IEC 17025:2017-Accredited Testing Laboratory

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About Beta Analytic

Beta Analytic was among the originators of the use of Accelerator Mass Spectrometry (AMS) for the ASTM D6866 biobased/biogenic testing standard using Carbon-14 to distinguish renewable carbon sources from petroleum sources. Beta began testing renewable content in 2003 at the request of United States Department of Agriculture (USDA) representatives who were interested in Beta's Carbon-14 capabilities for their BioPreferred[®] Program (www.biopreferred.gov). At their request, Beta joined ASTM under subcommittee D20.96. Beta's previous president, Darden Hood, was positioned as a technical contact for the USDA and, within 3 months, completed the ASTM D6866-04 standard. The Carbon-14 technique is now standardised in a host of international standards, including ASTM D6866, CEN 16137, EN 16640, ISO 16620, ISO 19984, BS EN ISO 21644:2021, ISO 13833 and EN 16785. Carbon-14 analysis can be used on various types of samples (gas, liquids and solids). Beta Analytic continues to be a technical contact for ASTM D6866, with current president Ron Hatfield, and is involved with all their latest ASTM D6866 versions.

The Carbon-14 standardised method is also incorporated in a variety of regulatory programs, including the California AB32 program, US EPA GHG Protocol, US EPA Renewable Fuels Standard, United Nations Carbon Development Mechanism, Western Climate Initiative, Climate Registry's Greenhouse Gas Reporting Protocol and EU Emissions Trading Scheme.

We are currently technical experts on Carbon-14 in the following committees:

- ASTM D6866 (D20.96) Plastics and Biobased Products (Technical Advisor)
- ASTM (D02.04) Petroleum Products, Liquid Fuels and Lubricants (Technical Advisor)
- ASTM (061) US TAG to ISO/TC 61 Plastics (Technical Expert)
- USDA BioPreferred Program TAC (Technical Advisor)
- ISO/TC 61/SC14/WG1 Terminology, classifications, and general guidance (Technical Expert)
- CEN/TC 411 Biobased Products
- CEN/TC 411/WG 3 Biobased content
- CEN/TC 61/SC 14/WG 1 Terminology, classifications, and general guidance (Technical Expert)

ISO/IEC 17025:2017 Accredited Laboratory

To ensure the highest level of quality, laboratories performing ASTM D6866 testing should be ISO/IEC 17025:2017 accredited or higher. This accreditation is unbiased, third party awarded and supervised. It is unique to laboratories that not only have a quality management program conformant to the ISO 9001:2008 standard, but more importantly, have demonstrated to an outside third-party laboratory accreditation body that Beta Analytic has the technical competency necessary to consistently deliver technically valid test results. The ISO 17025 accreditation is specifically for natural level radiocarbon

activity measurements including biobased analysis of consumer products and fuels, and for radiocarbon dating.

Required tracer-free facility for Carbon-14

For carbon-14 measurement to work, be accurate, and repeatable, the facility needs to be a tracer-free facility, which means artificial/labeled carbon-14 has not and has never been handled in that lab. Facilities that handle artificial carbon-14 use enormous levels relative to natural levels, and it becomes ubiquitous in the facility and cross-contamination within the facility, equipment and chemistry lines is unavoidable. Results from a facility that handles artificial carbon-14 would show elevated renewable contents (higher pMC, % Biobased / Biogenic values), making those results invalid. Because of this, the international standard for Carbon-14 testing, ASTM D6866, requires that AMS laboratories must be 14C tracer-free facilities and national programs (such as the USDA BioPreferred Program) apply this requirement in order to be considered for participation in solicitations.

Areas where cross-contamination might occur include but are not limited to; biomedical or nuclear reactors, isotope enrichment/depletion columns, water, soil, plant, or air samples collected near or at biomedical/nuclear reactor sites, medical, industrial, or hazardous waste sites, samples specifically manipulated to study the uptake/fractionation of stable isotopes due to biological or metabolic processes. To learn more about the risks associated with testing natural levels of Carbon-14 samples in a facility handling artificially enhanced isotopes, please see the additional information provided after this comment.

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February 19, 2026

**TESTIMONY ON HB 1986 HD1
RELATING TO A CLEAN FUEL STANDARD**

House Committee on Energy & Environmental Protection
Representative Nicole E. Lowen, Chair
Representative Amy A. Perruso, Vice Chair

Thursday, February 19 at 9:45 a.m.
State Capitol, Conference Room 325

Aloha Chair Lowen, Vice Chair Perruso, and members of the Committee,

Thank you for this opportunity to submit written testimony offering **comments** on HB 1986 HD1, Relating to A Clean Fuel Standard.

My name is Eric Wright and I serve as President of Par Hawaii. Par Hawaii is the largest local supplier of fuels, including various grades of utility fuels, as well as diesel, jet fuel, gasoline and propane.

HB 1986 HD1 would require the Hawaii State Energy Office (HSEO) to adopt rules governing a clean fuel standard for gasoline and diesel in the State. The bill would be similar to policies in West Coast jurisdictions, including California, Washington, and Oregon.

We recognize the importance of charting a clean energy future for Hawaii. As the local producer of fuels for Hawaii's consumers, we have committed to being a part of this future by investing over \$100 million to develop Hawaii's largest liquid renewable fuels manufacturing facility at our Kapolei refinery.

Par Hawaii currently employs more than 630 employees statewide, including those at our Kapolei refinery who are spearheading the production of renewable fuels. It is important that a clean fuel standard not create unintended consequences that result in job losses in Hawaii. Therefore, we recommend the bill be amended to add a provision that the Department of Transportation adopt rules to ensure that local production of fuels are not disadvantaged relative to imported fuels.

We also note the following with regard to a clean fuel standard for Hawaii:

1. Implementing and administering a clean fuel standard (CFS) is a significant undertaking. It is important that a broad range of stakeholders are consulted to avoid unintended consequences of this legislation. For example, a rise in gas



prices could disproportionately impact working families and small businesses, increase transportation and goods costs, and place additional financial strain on rural and neighbor island communities with limited alternatives.

2. Hawaii's energy landscape is significantly different than that of mainland states. We have much higher demands for aviation fuel and liquid fuels for power generation. It is important that a Hawaii CFS take into account the unique needs of our state.
3. The cost to produce renewable fuels for transportation is well above that of fossil fuels. While there are federal programs in place to partially bridge the gap, state level incentives are also required to make renewable fuels competitive with fossil fuels. We believe that a clean fuel standard should be paired with an expansion of the Hawaii renewable fuels production tax credit (HRS 235-110.32). This is particularly important because it can take years for the CFS credit market to develop to the point where it serves as an effective long-term incentive for renewable fuels.

We believe it is possible to produce significant amounts of renewable fuel here in Hawaii, and in a way that supports the local agriculture sector. Par Hawaii has partnered with Pono Pacific, a land management and conservation company, to develop locally grown, oil-yielding crops that will contribute to Hawaii's clean energy future.

In summary, we believe it is important to proceed cautiously and thoughtfully on a Hawaii CFS. We look forward to participating in this dialogue.

Thank you for allowing Par Hawaii the opportunity to present these comments for the Committee's consideration.



FEBRUARY 19, 2026

HOUSE BILL 1986 HD1

CURRENT REFERRAL: EEP

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Kris Coffield,
President

David Negaard,
Director

Mireille Ellsworth,
Director

Justin Salisbury,
Director

Eileen Roco,
Director

Beatrice DeRego,
Director

Corey Rosenlee,
Director

Amy Zhao,
*Policy and Partnerships
Strategist*

POSITION: SUPPORT

Imua Alliance supports HB 1986 HD1, relating to a clean fuel standard, which requires the Department of Transportation to adopt rules by 1/1/2028 governing a clean fuel standard for alternative fuels in the state..

Imua Alliance is a Hawai'i-based organization dedicated to ending all forms of exploitation, including the interconnected emergencies of climate change and sexual violence. According to research conducted by Michael B. Gerrard from Columbia Law School, modern-day slavery tends to increase after natural disasters or conflicts where large numbers of people are displaced from their homes. In the decades to come, says Gerrard, climate change will very likely lead to a significant increase in the number of people who are displaced and, thus vulnerable, to gender abuse.

Transportation is Hawai'i's largest source of climate pollution and the state's own planning identifies clean fuels as a near-term necessity alongside electrification. In its Energy Security and Waste Reduction Plan (October 2025), the Hawai'i Department of Transportation identifies implementing a Clean Fuel Standard (also known as a CFS) as an immediate administrative strategy to "incentivize the production and distribution of cleaner fuels," and states it is "poised to start a CFS feasibility study" to evaluate affordability impacts, especially for disadvantaged and rural communities. The plan further underscores why urgency is warranted: Hawai'i's 2022 inventory shows roughly 50% of statewide emissions come from transportation, with domestic aviation driving a very large share of transportation emissions.

A clean fuel standard reduces the average lifecycle carbon intensity of transportation fuels over time, while allowing compliance through a flexible credit market. Fuels cleaner than the benchmark generate credits; fuels above it generate deficits, creating a durable, technology-neutral incentive for low-carbon alternatives (renewable diesel, biofuels with verified

lifecycle benefits, electricity, hydrogen, and sustainable aviation and marine fuels, as applicable). HIDOT's Plan specifically notes Hawai'i must avoid incentivizing "alternative fuels with high upstream emissions," reinforcing the need for lifecycle accounting and guardrails.

This policy model is proven and scalable. The Washington State Department of Ecology reports that in the first year of Washington's Clean Fuel Standard, carbon intensity fell 1.3%—more than double the 0.5% statutory requirement—and program participants generated 1,946,406 credits (each equal to 1 metric ton CO₂e avoided). Washington's program targets a 45% reduction below a 2017 baseline by 2038. California's program—administered by the California Air Resources Board—and Oregon's Clean Fuels Program show similar market-based approaches can drive investment and cleaner fuel supply over time.

In addition to reducing emissions, a clean fuel standard can serve as a revenue-generating tool that supports Hawai'i's broader transportation and climate goals. In states with existing programs, credit market activity and compliance mechanisms have generated substantial economic value that can be reinvested locally. For example, Washington State reports that its clean fuel standard generated nearly 2 million credits in its first year alone, representing measurable emissions reductions and significant private-sector investment in clean fuels.

A Hawai'i Clean Fuel Standard could similarly generate revenue through fees, penalties, or credit auction mechanisms, with proceeds dedicated to priorities such as public transit, zero-emission vehicle infrastructure, sustainable aviation and marine fuels, rural energy resilience, and rebates or protections for households facing higher transportation costs. When designed thoughtfully, a CFS can reduce pollution while also strengthening energy security and funding equitable climate solutions.

To ensure a Clean Fuel Standard delivers real climate, health, and equity benefits for Hawai'i, implementation details will matter. According to HIDOT's 2025 Energy Security and Waste Reduction Plan, Hawai'i must be careful not to promote "alternative fuels with high upstream emissions" and should design policies that reflect the state's unique geography, import dependence, and neighbor-island realities. Strong sustainability safeguards, public reporting on credits and emissions reductions, and attention to affordability will be essential to maintaining public trust and maximizing the effectiveness of a CFS.

With aloha,

Kris Coffield

President, Imua Alliance



House Committee on Energy and Environmental Protection

Rep. Nicole E. Lowen, Chair

Rep. Amy A. Perruso, Vice Chair

Thursday, February 19, 2026

9:45AM, Conference Room 325

Feb 18, 2026

Re: Support for HB 1986 HD1 Relating to Clean Fuel Standard

Aloha Chair Lowen, Vice Chair Perruso, and members of the Committee,

As a manufacturer of electric vehicles (“EVs”) and EV charging infrastructure, **Rivian Automotive, LLC, (“Rivian”) is pleased to express its support for HB 1986 HD1.** A clean fuel standard is an elegant and proven policy that can catalyze growth in the EV sector without burdening the state budget.

The signature strength of the clean fuels standard (“CFS”) proposed by HB 1986 HD1 is its portfolio-based approach to expanding the use of a variety of clean fuels in Hawai‘i. This includes electricity. Clean fuels policies create new markets that marshall private capital for accelerated investment in the provision and use of clean fuels like electricity. Crucially, this means that the state can enjoy the benefits of a surge of investment in clean transportation fuel use—including job creation and growth—without requiring substantial new budget commitment and annual appropriations.

For the EV industry, the benefits of a clean fuels standard are many.

- A CFS establishes a market for trading compliance credits, creating powerful incentives for the use of a portfolio of clean fuels, including electricity.
- The use of electricity as a transportation fuel can be particularly beneficial under a CFS. In California, for example, to date charging providers have earned more than \$1 billion in compliance credits under the state’s low carbon fuel standard, a powerful “pull” factor encouraging further investment in building out the charging networks that earn those credits.¹
- With the appropriate policy frameworks in place, earnings from credit trading could also support retail consumer purchases of EVs and fleet-switching by

¹ California Air Resources Board, *California Low Carbon Fuel Standard Workshop*, April 10, 2024, www.arb.ca.gov/sites/default/files/2024-04/LCFS%20April%20Workshop%20Slides.pdf.



both light- and medium-/heavy-duty fleet operators—complementing the state’s ambitions to grow the EV market in Hawai’i.

Put simply, a well designed and implemented clean fuels policy can improve the economics of our business and help us achieve scale. The EV industry is eager to invest and grow our market in Hawai’i. To that end, while we believe the bill can be even stronger with the benefit of some select amendments, Rivian expresses its support for HB 1986 HD1.

Thank you for the opportunity to testify in support of this measure.

Sincerely,

Abigail Ramsden

About Rivian

Founded in 2009, Rivian is an independent U.S. company. Rivian manufactures all of its vehicles in the United States. With over 14,000 employees across the globe, Rivian’s expertise lies primarily in engineering, software development, and manufacturing.

In addition to our vehicles, Rivian is a manufacturer of direct current fast chargers (DCFC) and those chargers in our Rivian Adventure Network. We provide service to Rivian drivers in Hawai’i from our service center location on the island of O’ahu, creating local jobs and investment.



Environmental Caucus of The Democratic Party of Hawai'i

Wednesday, February 18, 2026

To: House Committee on Energy and Environmental Protection
Rep. Nicole E. Lowen, Chair
Rep. Amy A. Perruso, Vice Chair
Re: HB 1986 HD 1 re Clean Fuel Standard for Alternative Fuels
Hearing: Thursday, February 19, 2026, 9:45 am, Conference Room 325 & Video
Position: **OPPOSITION**

Aloha, Chair Lowen, Vice Chair Perruso, and Members of the Committee on EEP!

The Environmental Caucus of the Democratic Party of Hawai'i comprises some 6,680 members in all four counties of the State. We are active and aware of political developments and strongly support environmental protection, particularly in these very troubled times.

HB 1986 HD 1 would include burning of biofuels as part of a mix of a purported "clean fuel standard" for alternative fuels. For this reason, the Caucus respectfully **OPPOSES** this bill. There is simply not enough land and water in the State to sustain the local production of biofuels. We would have to import those biofuels. Moreover, such production, even if within the State, would compete with local food production, and it is clear that local food production is an extremely important value in itself.

Furthermore, burning biofuels results in serious air pollution, and it is very costly. Even as a "transition fuel." Burnable fuels are neither clean nor sustainable, and therefore they are not a viable "transition fuel."

We also believe that burning biomass is in violation of the State's responsibilities under the settlement agreement in the *Navahine F. v. Department of Transportation* case.

Accordingly, for all these reasons, we request that you please defer HB 2378. Thank you very much for the opportunity to testify.

Respectfully,

Alan B. Burdick, Co-Chair

Mike Ewall, Co-Chair

Melodie Aduja, Co-Chair *Emerita*

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legislativepriorities@gmail.com

HB-1986-HD-1

Submitted on: 2/18/2026 2:16:03 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Henry Curtis	Life of the Land	Support	Written Testimony Only

Comments:

Aloha

Please pass this bill.

Clean fuel standards are needed to reduce GHG

Mahalo

Henry Curtis

Executive Director



LATE

February 19, 2026

House Committee on Energy and Environmental Protection
Hawai'i State Legislature

RNG Coalition testimony in Support of HB 1986

Honorable Chair Kila and Members of the Committee,

The RNG COALITION strongly supports HB 1986, which would direct the Hawai'i Department of Transportation to establish a Clean Fuel Standard (CFS) to reduce lifecycle greenhouse gas emissions from transportation fuels.

The RNG COALITION is the national trade association representing the renewable natural gas (RNG) industry. Our members capture and upgrade methane from organic waste streams, including landfills, wastewater treatment facilities, and agricultural waste into renewable natural gas, which one end use is as a low-carbon transportation fuel.

Transportation is Hawai'i's largest source of greenhouse gas emissions, and decarbonizing this sector is essential to meeting the State's long-term climate commitments. A Clean Fuel Standard is a technology-neutral, market-based policy that reduces emissions by rewarding fuels based on lifecycle carbon intensity. This approach has proven highly effective in other states, including California, Oregon, and Washington.

HB 1986 appropriately incorporates best practices from existing CFS programs by:

- Using the Argonne National Laboratory's GREET model to measure lifecycle emissions
- Establishing a credit-and-deficit system that rewards environmental performance
- Allowing for credit trading, banking, and program linkage with other jurisdictions
- Including cost-containment mechanisms to ensure compliance flexibility

Importantly, a CFS creates new markets for fuels produced from waste streams that are particularly relevant to Hawai'i, including organic waste, wastewater, agricultural residues, and biogas-derived fuels such as renewable natural gas. These fuels can be used directly in existing vehicles and infrastructure, providing immediate emissions reductions, especially for heavy-duty and hard-to-electrify transportation sectors.

HB 1986 represents a thoughtful, flexible, and proven framework for reducing transportation emissions while supporting local economic development and energy resilience. For these reasons, the RNG Coalition urges the Committee to support HB 1986.

Respectfully,

Yanni Psareas

Manager of State Government Affairs

RNG COALITION

yanni@rngcoalition.com

HB-1986-HD-1

Submitted on: 2/14/2026 9:59:48 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Kara Watada	Individual	Support	Written Testimony Only

Comments:

Representative Trish La Chica, Chair

Senator Donovan Dela Cruz, Senator

Enhanced Enforcement Program

HB1986

February 19th, 2026

325 via Video Conference, 9:45 AM

Hello representatives and senators, my name is Kara Watada and I am a student from Mililani High School and I'm testifying in support of HB1986.

Many of us don't realize it, but there are a lot of unsustainable ways Hawai'i deals with their waste. Whether it's through landfills or furnaces, it always ends up with pollution in the air. This pollution leads to a chain of events with pollution contributing to climate change which affects the weather patterns. A lot of people can get sick from the fluctuating changes in the weather and I'm one of those people. I have a very weak immune system and a lot of the time when I'm sick, I have to stay home from school. That means I'm missing out on proper education and I'm missing critical moments of my social life by missing out on moments with my friends. Who knows how many people in Hawai'i have the same problem as I do? People in Hawai'i shouldn't be struggling to fight for the basic right of breathing fresh air.

Supporting this bill is a way that can stop the spread of climate change while also being able to find sustainable ways to get rid of our waste. Please consider this bill for me, other sickly kids, and for the future generations ahead of us.

Sincerely,

Kara Watada

Mililani High School

HB-1986-HD-1

Submitted on: 2/16/2026 1:02:08 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Georgia L Hoopes	Individual	Oppose	Written Testimony Only

Comments:

Aloha Committee Members!

There is not enough land or water in the state to produce biofuels domestically. Precious land and water should be used for local food production, not fuel. Biofuels will be imported from North and South America where they are grown in monoculture plantations of genetically modified crops, often directly or indirectly deforesting areas.

They all make pollution when burned, meaning that they are a short-term solution because state law requires zero greenhouse gas emissions by 2045.

Switching in less than 20 years from fossil fuels to biofuels, then again to supposedly carbon-free "electrofuels" will massively increase energy costs instead of simply phasing in one transition by electrifying and transitioning to conservation, efficiency, solar, wind, and energy storage.

Waste-based fuels, such as the plans to liquefy trash in Maui or construction and demolition waste in O'ahu have many toxic chemicals involved, and will result in toxic ash and toxic air emissions. These experimental pyrolysis and gasification technologies have been a failure throughout the country and cannot operate commercially, but could suck up public subsidies before the failures become obvious.

Mahalo!

Georgia Hoopes, Kalaheo

HB-1986-HD-1

Submitted on: 2/16/2026 3:54:39 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Ken Stover	Individual	Oppose	Written Testimony Only

Comments:

oppose

HB-1986-HD-1

Submitted on: 2/16/2026 4:55:06 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Yuma Kamuro	Individual	Support	Written Testimony Only

Comments:

Aloha Members of the House Committee of Energy and Environmental Protection,

My name is Yuma Kamuro, and I am a student at Mililani High School. I am testifying in support of H.B.No.1986.

I support this bill because it helps reduce Hawaii's dependence on imported fossil fuels while creating new economic opportunities. Every year, billions of dollars leave Hawaii to pay for gas and oil instead of being invested in our communities.

Establishing a clean fuel standard will create new job opportunities in areas such as renewable energy, clean transportation, and green technology. For a long-term vision, cleaner and more efficient fuel options will help stabilize the costs and reduce our exposure to the volatile oil prices.

For these reasons, I strongly urge the committee to pass HB1986 and support a more innovative, resilient, and sustainable future for Hawaii.

Thank you for the opportunity to testify.

Sincerely,

Yuma Kamuro

HB-1986-HD-1

Submitted on: 2/16/2026 7:20:13 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Alice Abellanida	Individual	Oppose	Written Testimony Only

Comments:

I oppose this bill.

Representative Nicole E. Lowen, Chair
Representative Amy A. Perruso, Vice Chair
Committee on Energy & Environmental Protection

Thursday, February 19, 2026
9:45 a.m., Conference Room 325
Hawaii State Capitol

Support for H.B. No.1986

Aloha, Chair Lowen and Members of the House Committee on Energy & Environmental Protection,

My name is Savitri Dube and I am a student at Mililani High School. I am testifying **in support** of H.B.No. 1986.

I am testifying in support of the implementation of the usage of alternative clean fuels by the Department of Transportation. With transportation identified as the largest source of greenhouse gas emissions in the state, using alternative fuels with lower carbon intensity will benefit the economy, society and environment. Using cleaner fuel sources stimulates more local economic practices while expanding the job market as well. Minimizing greenhouse gas emissions also promotes public health and reduces the amount of pollution released into the environment. Requiring reports and updates of the continued use of alternative fuels also implements strong regulations to be followed, helping the state achieve a clean fuel standard. With such a prized and natural beauty to the island we call home, it is our job to protect and care for it in return. Reducing transportational reliance on fossil fuel-based fuels is a major step in ensuring the conservation of our land for future generations.

I hope you will consider passing H.B. No. 1986 because it will significantly help reduce carbon and greenhouse emissions statewide to allow for a safer environment in the future. Thank you for the opportunity to testify.

Sincerely,

Savitri Dube
Mililani High School

HB-1986-HD-1

Submitted on: 2/17/2026 1:07:07 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Clint Jay Nocasa	Individual	Support	Written Testimony Only

Comments:

Representative Nicole E. Lowen, Chair

Representative Rep. Amy A. Perruso, Vice Chair

Committee on Energy & Environmental Protection

Thursday, February 19, 2026

9:45 A.M.

State Capitol

Support for H.B. no.1986

Aloha, Chair Lowen and members of the House Committee on Energy & Environmental Protection,
My name is Clint Jay Nocasa and I am a student at Mililani High School. I am testifying **in SUPPORT of H.B. no.1986.**

I am testifying to support the clean fuel standard. As we all know, transportation is an important part of our everyday lives, but it is also one of the biggest sources of pollution on our islands. A Clean Fuel Standard is a way that we can reduce the amount of greenhouse gas emissions that everyday transportation creates. I personally, try to drive as little as possible to try and help with the greenhouse gas emissions one car at a time. With the bill, it will promote the use of clean fuels, and therefore more emission-efficient vehicles.

I hope that you consider passing H.B.no.1986 because it will help Hawai'i become a more clean, emission-efficient, and better island. Thank you for the opportunity to testify.

Sincerely,

Clint Jay Nocasa

Mililani High School

HB-1986-HD-1

Submitted on: 2/17/2026 10:28:17 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Rylan Sergent	Individual	Support	Written Testimony Only

Comments:

Representative Lowen, Chair
Representative Perruso Vice Chair
House Committee on Agriculture
Thursday, February 19, 2026
9:30AM, House conference room 430
Hawaii State Capitol
Support for H.B. No.1986

Aloha, Chair Lowen and Members of the House Committee on Agriculture,
My name is Rylan Sergent and I am a student at Mililani High School. I am testifying in support of H.B.No. 1986.

My name is Rylan Sergent, and I am a high school student in Hawai'i. I am writing in strong support of HB 1986 because I believe it promotes pono stewardship of aina and helps protect our natural resources for future generations. As students growing up in Hawai'i, we learn that the land is not just property but part of our identity and culture. It is our kuleana to care for it.

HB1986 supports responsible environmental management and helps ensure that development and decision-making do not harm our ecosystems. Hawai'i's land and waters are already under pressure from pollution, climate change, and overuse. By strengthening protections and encouraging sustainable practices, this bill helps preserve biodiversity, protect native species, and maintain the health of our communities. When we take care of the aina, it takes care of us.

Pono stewardship means making choices that balance economic growth with environmental responsibility. Supporting this bill shows that Hawai'i values long-term sustainability over short-term gain. Future generations deserve clean water, healthy reefs, fertile soil, and open spaces just like we do today.

For these reasons, I respectfully urge you to support HB1986. mahalo for your time and for your commitment to protecting Hawai'i's aina.

Sincerely,

Rylan Sergent

HB-1986-HD-1

Submitted on: 2/17/2026 1:51:39 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Reagan H	Individual	Support	Written Testimony Only

Comments:

Dear committee members,

My name is Reagan and I live in Mililani. I wish to express my support for bill HB1986, as it means a betterment of air quality for the future, especially for youth like me. This incentive and its ability to further enhance job opportunities will create more ways for teenagers to be involved when they take charge later on.

Furthermore, as mentioned in bill HB1986, the opportunity to reduce greenhouse gas emissions becomes higher with this effort and spread awareness. Future generations could stand to learn from this moment, if you so gave it a chance to flourish into something great.

Therefore, I urge the committee to vote yes when considering bill HB1986.

Thank you for your time and consideration.

Sincerely,

Reagan H.

HB-1986-HD-1

Submitted on: 2/17/2026 5:41:16 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Bobbie Best	Individual	Oppose	Written Testimony Only

Comments:

I agree with the Energy network and Life of the Land

HB-1986-HD-1

Submitted on: 2/17/2026 7:00:20 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Elle Baltch	Individual	Support	Written Testimony Only

Comments:

To:

Darius K. Kila, Chair

Tyson K. Miyake, Vice Chair

House Committee on Transportation

February 18, 2026 – 9:30 a.m.

Hawaii State Capitol

Dear Chairs and Members of the Committee,

My name is Elle Baltch, and I am submitting testimony in strong support of HB1986, Relating to a Clean Fuel Standard. I am from Mililani High School.

As a student in Hawaii, I care deeply about the future of our islands. Our generation will live with the long-term impacts of climate change, rising costs of living, and energy insecurity. Establishing a Clean Fuel Standard is an important step toward reducing greenhouse gas emissions, strengthening energy independence, and creating a more sustainable transportation system for our communities.

Hawai'i relies heavily on fossil fuels, which makes us vulnerable to price volatility and supply disruptions. A Clean Fuel Standard would encourage the development and use of cleaner alternatives, promote innovation, and support local economic opportunities in renewable energy and transportation technologies that would tremendously benefit our community. It is a forward-thinking, market-based approach that aligns with our state's climate commitments and our responsibility to protect our environment.

Passing HB1986 would demonstrate strong leadership and a commitment to protecting the health, economy, and future of Hawai'i's residents. Especially young people like me who will obtain the results of today's policy decisions.

I respectfully urge you to pass HB1986.

Mahalo for your time and consideration.

Sincerely,
Elle Baltch
Mililani High School

Representative Trish La Chica, Chair
Senator Donovan Dela Cruz, Senator
Enhanced Enforcement Program

HB1986

Tuesday, February 17, 2026

325 via Video Conference, 9:45 AM

Support for H.B. No.1986

Aloha, Chair La Chica and members of the Enhanced Enforcement Program,

My name is Rejohn Morin, an APES student at Mililani High School, testifying **In support** of H.B. No.1986.

This bill touches on a global problem that I feel that the majority of America has not been taken seriously for a long time. Usually in my personal life, I don't find anyone actively worried about the environment, worried about the trials and tribulations of fuel's impact on the world or in any other ways to make it a big issue to their lives. However, I support the implementation of this bill, its purpose to push a clean fuel standard in society and the very people that do all they can to drive what seems like a distant dream into reality. It is very effective to be analyzing the main source of the problem and tackling it with the support of many communicative brains, dealing with carbon emissions from the very things that people use constantly to get things done, that being cars and transportation. I took notice in the states that seem to already have taken part of the clean fuel standard, one of them being California, generally known for the second most contributing state of greenhouse gas emissions. Despite being a part of the contributing majority of emissions, they are pushing for change and recognizing that there is change to be done that can be adopted throughout the everyday lives of the people. I found that to be quite bold and noble that people are still trying their hardest to maintain the life we must hold dear. In addition to the implementation of the clean fuel standard, the department of transportation promises to conduct informational public sessions in each county a year after the standards have been passed for the purpose of monitoring and communicating on implementation. This seals the deal in people committing to maintenance of environmental impact, showing how it would simply be an act passed on to be half-heartedly followed, but an expanding collaborative effort among people in the states to work and improve in support of their environmental cause. One worry I want to make known is that in section 3 of the HB1986 bill it is said for the Act to be taken effect by July 1, 3000. I give the benefit of the doubt that this may be a place holder to determine the more realistic date of taking action, but this worries me that this doesn't help convey the urgency and importance of the bill given the massive 980 years space in the time frame. Shouldn't we be pushing this matter more urgently and seriously?

Worries aside, I am hopeful and confident that the departments, communities and people in support of the environment will find success in passing H.B. No.1986 to bring awareness to one of our country's greatest problems and lay down faith that they may achieve such goals with great work and pride to improve not just a few states, but the continuous development of the U.S.

Sincerely,

Rezjohn Morin
Mililani High School

HB-1986-HD-1

Submitted on: 2/17/2026 8:35:09 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Maddison Miyasato	Individual	Support	Written Testimony Only

Comments:

Dear Chair and Members of the Committee,

As a high school student in Hawai‘i, my generation will inherit the consequences of today’s energy decisions. HSCR91-26 is not just a transportation policy, it is a commitment to our future. I strongly support requiring the Department of Transportation to adopt a Clean Fuel Standard by 2028 because it protects Hawai‘i’s environment, economy, and the well-being of young people like me.

Hawai‘i imports nearly 90% of its energy, making us one of the most oil-dependent states in the nation. The transportation sector is the largest source of greenhouse gas emissions in Hawai‘i, accounting for more than half of the state’s petroleum use. Every time fuel prices spike, families feel it at the gas pump, in food prices, and in everyday expenses. A Clean Fuel Standard would gradually lower the carbon intensity of fuels while expanding cleaner alternatives like renewable biofuels, electricity, and hydrogen. States such as [California](#) have implemented similar standards and reduced millions of metric tons of carbon emissions while attracting billions of dollars in clean energy investment.

For students, this bill connects directly to our classrooms and careers. Many of us are studying renewable energy, environmental science, engineering, and healthcare. Cleaner air means lower rates of asthma and respiratory illness conditions that disproportionately affect children. A transition to cleaner fuels also creates local jobs in technology, infrastructure, and sustainable innovation, providing career pathways right here in Hawai‘i instead of forcing young people to leave the islands.

We are already witnessing the effects of climate change through stronger storms, coastal erosion, and wildfires. A Clean Fuel Standard sends a powerful message: Hawai‘i refuses to be passive. We choose innovation over dependence and resilience over risk.

HSCR91-26 is an investment in sustainability, economic stability, and intergenerational responsibility. I respectfully urge you to pass this bill and help secure a cleaner, safer future for Hawai‘i’s students and families.

Sincerely,

Maddison Miyasato

HB-1986-HD-1

Submitted on: 2/17/2026 9:35:34 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Chaix Mooney	Individual	Support	Written Testimony Only

Comments:

Representative Nicole E.Lown, Chair

Representative Amy A. Perruso, Vice Chair

Committee on Energy and Environmental Protection

Thursday, February 19, 2026

9:45 AM, Conference Room 325

Support for HB1986

Aloha, Committee on Energy and Environmental Protection

My name is Chaix Mooney, and I am a student at Mililani High School. I am testifying in favor of HB1986.

I wanted to testify for this because a clean fuel standard is crucial for our environment. This bill can improve public health, due to the lowered amount of harmful pollutants. I am in favor with this bill because this can be the start of helping our environment for a better cleaner future, by reducing greenhouse gas emissions, that pollute the air we breathe in and are surrounded by.

I hope you will consider this testimony in your final decision. This bill would be a way to change our future for the better and be a way to protect future generations from having to deal with these harmful pollutants. Thank you for reading this testimony.

Sincerely,

Chaix Mooney

Mililani High School

HB-1986-HD-1

Submitted on: 2/17/2026 9:42:15 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Michael Rice	Individual	Support	Written Testimony & Only

Comments:

To:

Representative David A. Tarnas, Chair

Representative Linda Ichiyama, Vice Chair

House Committee on Energy & Environmental Protection (EEP)

RE: Testimony in Support of HB1986

Aloha Chair Tarnas, Vice Chair Ichiyama, and Members of the House Committee on Energy & Environmental Protection,

My name is Michael Rice, and I am a student at Mililani High School. I respectfully submit this testimony in strong support of HB1986 because it aligns with the principles of pono stewardship of ‘āina and our kuleana to protect Hawai‘i’s natural resources for future generations.

In Hawai‘i, ‘āina is not simply land—it is our foundation, our history, and our responsibility. The concept of mālama ‘āina teaches us that when we care for the land, the land cares for us. HB1986 supports this responsibility by strengthening environmental protections and encouraging more sustainable decision-making. Policies that prioritize conservation, restoration, and long-term environmental health ensure that development does not come at the expense of our ecosystems.

As a student growing up in Hawai‘i, I have learned that stewardship is not optional—it is a kuleana. We see firsthand the impacts of climate change, habitat loss, and pollution on our reefs, forests, and freshwater systems. Taking proactive steps through legislation like HB1986 reflects leadership that is rooted in Hawaiian values. Protecting natural resources preserves biodiversity, safeguards cultural practices, and strengthens food and water security across the islands.

Pono stewardship means acting with balance, wisdom, and responsibility. Supporting HB1986 demonstrates a commitment to thoughtful governance that respects both community needs and environmental limits. Future generations deserve clean water, healthy soil, thriving native species, and access to natural spaces that connect them to their heritage.

Mahalo for the opportunity to provide testimony. I urge the committee to pass HB1986 in order to uphold our shared kuleana to care for Hawai‘i’s ‘āina.

Respectfully,

Michael Rice
Mililani High School Student
Mililani, Hawai'i

HB-1986-HD-1

Submitted on: 2/17/2026 10:35:40 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Mia Bautista	Individual	Support	Written Testimony Only

Comments:

My name is Mia Bautista, a senior at Mililani high school, and I am in support of the HB1986 bill.

As a resident of Hawai`i, I've known a lot of people who rely on public transport as a means to get around the island. Whether it's a friend who needs a ride from school to home or a family member that doesn't have a car to get to work, it's a crucial aspect of their life. However, this reliance on public transport doesn't take away the damage most of the fuel used creates for our environment. The same friends and family have to struggle with pollen, vog, and other environmental conditions that give them allergic reactions. Some have to bear with a mild cough all day, while others are chained to a mask to shield themselves. Due to their own personal reasons on why they use public transport, it wouldn't be fair to have these people suffer everyday as a result of something they cannot control. To own their own terms of transport is a privilege in itself that most of us forget nowadays.

Ask yourselves: would you want someone you know to continue to suffer like that?

To have a standard for the sort of fuel used would be a step in the right direction. Setting a regulation on what standard transports use won't solve every problem we have with our current environment state, but it's a starting point. I'm 100% sure if this bill goes in, then we as a community have a fighting chance for our future of Hawai`i.

Please consider it. Even if it's small.

With great hopes,

Mia Bautista

Mililani Highschool

HB-1986-HD-1

Submitted on: 2/18/2026 2:42:15 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Jensen Chan	Individual	Support	Written Testimony Only

Comments:

Representative Nicole E. Lowen, Chair
Representative Amy A. Perruso, Vice Chair
House Committee on Energy & Environmental Protection

Support for H.B. No.1986

Dear Esteemed Representatives,

My name is Jensen Chan and I'm a student at Mililani High School. I am testifying *in support* of H.B.No. 1986.

I am testifying specifically in support of the creation of a clean fuel standard. One of the greatest things about Hawai‘i is its clean air. Hawai‘i is one of the places where you can truthfully say “I’m going out for a breath of fresh air”. There isn’t a bad day where the air’s unhealthy to breathe. You can’t say the same for places like New York or other big urban areas on the mainland. That’s why I believe you should pass this bill. It’s important we maintain Hawai‘i’s pristine air quality. My mother enjoys Hawai‘i for its fresh air, especially since she’s an asthmatic. Transitioning to cleaner fuels reduces the amount of toxic pollutants released. This would simultaneously maintain the overall health of residents, particularly in the urban areas of Hawai‘i, and lower healthcare costs.

Overall, I would like this bill to be passed because it would maintain an important aspect of Hawai‘i and also maintain the population's health. I hope you consider my points deeply. Thank you for reading this, I appreciate your endless work in improving Hawai‘i.

Sincerely,

Jensen Chan

HB-1986-HD-1

Submitted on: 2/18/2026 8:34:30 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Rayson Agueroyamamoto	Individual	Support	Written Testimony Only

Comments:

Representitive Nicole E. Lowen, Chair

Representitive Amy. A Perruso, Vice Chair

House Committee on Energy & Envrionmental Protection

Thursday, February 19, 2026

9:45 a.m. House conference room 325

Hawaii State Capitol

Support for H.B. No. 1986

Aloha, Chair Lowen and Members of the House Committeee on Energy & Environmental Protection.

My name is Rayson Agueroyamamoto and I am a student at Mililani High School. i am testyfyng in support of H.B. No. 1986.

I believe that is vital to pass this bill for the future of our community. Transportation is the largest souce of greenhouse gas emissions in our state. If we are committed to reducing climate pollution and meet our clean energy goals, we must address the emissions from cars, trucks, planes and ships.

H.B. No. 1986 would require Hawai'i Department of Transportation to finally establish a clean fuel standard. This policy will gradually lower our greenhouse gas emissions over time, eventually meeting our goal.

I hope you will consider passing H.B. No. 1986 because it is a practial, yet necessary step that we must take towards a cleaner and more sustainable future for the state of Hawai'i.

Sincerely,

Rayson Agüero-Yamamoto

Mililani High School

HB-1986-HD-1

Submitted on: 2/18/2026 8:46:40 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Caroline Azelski	Individual	Support	Written Testimony Only

Comments:

In support of. Thank you.

Representative Darius K. Kila, Chair
Representative Tyson K. Miyake, Vice Chair
House Committee on Transportation

Tuesday February 3rd, 2026
10:30am, House Conference Room 430
Hawai'i State Capitol

Support for H.B. No. 1986

Aloha, Chair Gates and Members of the House Committee on Transportation. My name is Tealoha O Talani Carino-Ascencio and I am a student at Mililani High School. I am testifying in support of H.B. No. 1986.

I am testifying in support of A Clean Fuel Standard. This policy is crucial for reducing Greenhouse contributors to climate change and respiratory illness. Using cleaner fuel such as biofuels and electricity, we can improve air quality, protect public health, and create a more sustainable future for everyone.

In closing I hope you guys will consider the evidence represented and make a decision that reflects the best interest of justice and the well-being of our community. Mahalo.

Sincerely,
Tealoha O Talani Carino-Ascencio
Mililani High School

HB-1986-HD-1

Submitted on: 2/18/2026 9:25:58 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Jacie Oshiro	Individual	Support	Written Testimony Only

Comments:

My name is Jacie Oshiro and I am a student at Mililani High School. I am testifying in support of HB1986.

I am testifying to reduce greenhouse gas emissions. It would help improve the health of our citizens in Hawai'i. It would reduce the carbon on transportation and result in a better environment, protecting our native lands.

As a resident in Hawai'i, our health and environment is a big priority. Going with this testimony would have cost savings with gas and helping the alternative measures be met before continuing. California, Oregon and Washington had gone through with alternative services and it was successful.

I hope you would consider passing HB1986 because it will help our island, health, and environment. It will make a better chance of a good future for future generations. Thank you for the opportunity to testify.

Sincerely,

Jacie Oshiro

Mililani High School

HB-1986-HD-1

Submitted on: 2/18/2026 9:26:27 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Arianna	Individual	Oppose	Written Testimony Only

Comments:

Representative Darius K. Kila, Chair

Representative Tyson K. Miyake, Vice-Chair

Opposition for H.B. No.1986

Thursday, February 19th

9:45 AM

Conference Room 325

Hello! My name is Arianna Neuhauser, a student of Mililani High School, and I am testifying in Opposition of H.B No.1986

I oppose H.B No.1986 because it backpedals on the goals of Navahine F v. Hawai'i Department of Transportation. The current goal for the HDOT is to decrease Transportation sector emissions to zero by 2045. By changing the goal to below 50% of 2019 levels by 2045, the Hawai'i Department of Transportation fails to continue pushing towards the Zero Emissions goal at the same speed or with the same importance. Striving to reach Zero Emissions goal with the same urgency is crucial to positive contributions towards our climate.

For this reason, I hope that you will stay committed to the Zero Emissions goal established by Navahine F v. Hawai'i Department of Transportation. Thank you for the opportunity to testify.

Sincerely

Arianna Neuhauser

HB-1986-HD-1

Submitted on: 2/18/2026 9:30:35 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Kaua'i Kela	Individual	Support	Written Testimony Only

Comments:

Representative Darius K. Kila, Chair

Representative Tyson K. Miyake, Vice Chair

House Committee of Transportation

Thursday, February 19, 2026

9:45am, House conference room 325

Hawai'i State Capitol

Support of H.B. No.1986

Aloha, Chair Kila and Members of the House Committee on Transportation,

My name is Kaua'i Kela and I am a student of Mililani High School. I am testifying **in support** of H.B. No.1986.

House Bill 1986 represents an important step forward for our community and reflects our important values that make Hawai'i unique. This bill addresses the critical concerns facing not just our state, but our Earth in general and provides thoughtful, forward-thinking solutions that will make a positive impact starting with the residents across our islands. The industry of tourism and our transportation services is the largest source towards the driving increase of greenhouse gas emissions. The bill will help fight against further impacts towards our environment like climate change and protect public health from going downhill. Cleaner fuel will be met overtime through the targets of carbon intensity levels by 2045 overall. The encouraging manner of clean energy alternatives can help us reduce our alliance on imported fossil fuels

which also keeps more economic investment within Hawai'i's economy. Reducing the pollutants from our transportation services can reduce the instances of asthma, heart disease and other respiratory problems tied to the leading cause of air pollutants in our communities statewide. Cleaner fuel can help with our landscape restoration too. This bill can make a difference towards the future of our keiki and the way they grow up.

I respectfully urge the committee to support and advance H.B. No.1986. Mahalo for your time and consideration towards my testimony for the future of the people of Hawai'i.

Sincerely,

Kaua'i Kela

HB-1986-HD-1

Submitted on: 2/18/2026 9:44:36 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Kalea Lachica	Individual	Support	Written Testimony Only

Comments:

Representative Nicole Lowen

Representative Terez Amato

Representative Della au Bellati

H.B. 1986, Relating to a Clean Fuel Standard

Thursday, February 19, 2026

9:45AM, Video Conference 325

Hawai'i State Capitol

Support for H.B. No.1986

Aloha, Chair Gates and Members,

My name is Klay Lachica, a Junior student of Mililani High School, I am here to address and testify in support of H.B.No. 2083.

I am testifying in support of this bill because it truly speaks upon the idea that the quicker we can start a cleaner fuel economy, the better our chances are to save our planet. Creating various mechanisms that counteract the greenhouse effects, such as adjusting the carbon intensity are some small ways to take a good step in the right direction to success in becoming a cleaner planet. Although the switch for transportation and such will be difficult, taking lots of time within each country to speak upon the change, once it is in

effect, I believe the pros will significantly outweigh and shine through the cons that may occur. Without a true stepping stone to start this movement, it can be difficult to start in the first place. H.B. No. 1986 creates that stepping stone, giving us as a community plenty of time to make the change.

I hope you will consider passing H.B. No. 1986 because it is necessary to move our state towards a more clean, clear, and safe planet for future generations.

Sincerely,

Klay Lachica

Mililani High School

HB-1986-HD-1

Submitted on: 2/18/2026 9:45:58 AM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Angeline Dimaya	Individual	Support	Written Testimony Only

Comments:

Representative Nicole E. Lowen, CHair

Representative Elle Cochran, Vice Chair

House COmmittee on Energy and Environmental Protection

Wednesday, February 19, 2026

9:45 am COnference Room 325 & Videoconference

Hawaii State Capitol

Re: Support for H.B. NO.1986- Relating to a Clean Fuel Standard

Aloha Chair Lowen, Vice Chair Cochran, and Members of the Committee

My name is Angeline Dimaya, and I am a student at Mililani Highschool in Mililani, Hawaii. I am testifying in support of H.B. No. 1986, which establishes a clean fuel standard for alternative transportation fuels in our state.

Transportation in Hawaii creates a vast amount of greenhouse gas emissions, and a tourism based economy that heavily relies on transportation. A clean fuel standard is very necessary to lower the carbon footprint that affects our public health every single day. By aligning with a target for at least 10 percent below the carbon intensity levels from 2019 leading to the year of 2035. This bill can keep Hawaii on track to a better climate, and island health. As a student and a part of the Hawaii community I wanna use my voice and a chance to shape our reality for a better future. Hawaii is unique for its environment and to

support a policy on helping our local farmers and clean fuel producers is almost non negotiable.

Mahalo,

Angeline Dimaya

Student, Mililani Highschool

Mililani, Hawaii

HB-1986-HD-1

Submitted on: 2/18/2026 1:07:39 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Tina Even	Individual	Oppose	Written Testimony Only

Comments:

I oppose this bill.

Tina Marie Even

Representative Nicole E. Lowen, Chair
Representative Amy A. Perruso, Vice Chair
Committee On Energy & Environmental Protection

Thursday, February 19, 2026
9:45 AM, Conference Room 325
Hawaii State Capitol

Support for H.B. No.1986

Aloha, Chair Gates and Members of the Committee On Energy & Environmental Protection,

My name is Mari Sugai and I am a student at Mililani High School. I am testifying in support of H.B. No.1986.

I am testifying for the establishment of a Clean Fuel Standard for the state of Hawaii. Transportation is one of our largest sources of greenhouse gas emissions, and without regulations that target this problem, we will fail to meet our environmental and economical goals. This bill will incorporate a market-based approach by rewarding cleaner fuels and encouraging innovations that will strengthen our environment. It will create new economic opportunities by turning solid waste, used cooking oil, agricultural and forestry residuals, and industrial emissions, into valuable clean energy resources. A Clean Fuel Standard will not only reduce greenhouse gas emissions, but also improve Hawaii's air quality. By increasing demand for cleaner fuels, this bill aims to improve public health and protect our environment.

I hope you will consider passing H.B. No.1986, as it will sustain our environment and ensure a healthy 'āina for our future. Mahalo for the opportunity to testify.

Sincerely,
Mari Sugai

LATE

HB-1986-HD-1

Submitted on: 2/18/2026 11:24:30 PM

Testimony for EEP on 2/19/2026 9:45:00 AM

Submitted By	Organization	Testifier Position	Testify
Ian	Individual	Support	Written Testimony Only

Comments:

I respectfully **support HB 1986** — a bill that would require the Department of Transportation to adopt rules establishing a **clean fuel standard for alternative fuels** in Hawai‘i by January 1, 2028.

This legislation is a meaningful step toward **reducing transportation-related greenhouse gas emissions**, which are Hawai‘i’s largest source of lifecycle carbon emissions. A clean fuel standard helps shift our economy toward cleaner, low-carbon transportation fuels and technologies — supporting public health, environmental sustainability, and economic development.

Key Reasons I Support HB 1986:

1. **Environmental Protection:** A clean fuel standard will help lower greenhouse gas emissions and improve air quality for all residents and visitors in Hawai‘i.
2. **Economic Opportunity:** By encouraging investment in alternative fuels and clean transportation technology, the bill incentivizes **local job creation** in emerging sectors such as renewable fuels and sustainable energy infrastructure.
3. **Public Engagement:** The bill includes requirements for public informational sessions and reporting, ensuring transparency and input from communities across all counties as the rulemaking process unfolds.

Transportation fuels account for a significant portion of our state’s emissions. Passing HB 1986 will position Hawai‘i alongside other forward-thinking states that have used clean fuel standards to reduce carbon intensity and support climate goals while fostering economic growth.

For these reasons, I urge the Committee to **pass HB 1986** and move Hawai‘i toward a cleaner and healthier future.

Mahalo for the opportunity to testify.

Respectfully submitted,
Ian Murasaki
Mililani Hawaii