

Summary of the Transportation Sector Workshop, Nov. 13th, 2014
DBEDT, Hawaii State Energy Office

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Background

The Hawaii State Energy Office has contracted The International Council on Clean Transportation (ICCT) to provide analysis, recommendations, and facilitate stakeholder engagement to support the development of a clean transportation plan under a revised Hawaii Clean Energy Initiative (HCEI). The ICCT is analyzing the progress to date on the transportation section of the HCEI Roadmap 2011 Edition, and assessing what can realistically be achieved in terms of gasoline and diesel reductions by 2030. Through a series of stakeholder consultations held between November 2014 and June 2015 (collectively referred to as the "Transportation Charrette"), the ICCT will offer for consideration a new set of transportation options, goals and timeline to reduce consumption of petroleum-based fuels in the transportation sector, including aviation, ground and marine transportation.

In advance of the workshop, the ICCT conducted phone interviews with over 40 stakeholders to gather insights on recent progress, relevant data, suggested policy options, and future outlook. All stakeholders are encouraged to submit relevant data, and specific policy proposals to the State Energy Office as well as the ICCT. In order to ensure accurate and timely analysis of various policy pathways, stakeholders are urged to submit written comments by December 29, 2014 to **Lynda Viray (Lynda.C.Viray@dbedt.hawaii.gov)** and **Josh Miller (josh@theicct.org)**.

1 Introduction

This document provides a summary of the first Transportation Sector Workshop, which was held to support the development of a revised transportation plan under the Hawaii Clean Energy Initiative. The workshop was held on November 13, 2014 at the Royal Hawaiian Hotel and attended by over fifty representatives from federal, state and local government, military, industry, academia, and civil society.¹ The objectives of the workshop were to 1) present the ICCT's analysis of recent progress the transportation sector compared to the transportation plan outlined in the 2011 edition of the Hawaii Clean Energy Initiative (HCEI) Roadmap; 2) discuss the current state of the transportation sector and the implications for a revised transportation plan; and 3) collect feedback from local experts on the feasibility and potential impacts of transportation petroleum reduction tactics relating to Managing Travel Demand and Alternative Fuels. This workshop was the first milestone in the Transportation Industry Analysis being conducted by the ICCT; this project aims to achieve a working agreement on a revised clean transportation plan including implementation steps, and conclude with a final summary report in June 2015 (Table 1).

Table 1. Project timeline for transportation industry analysis

Action	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15
Workshop on analysis of HCEI 2011, fuels and TDM								
Workshop on electric drive vehicles and fuels								
Web-meetings on vehicle efficiency, aviation and marine tactics								
Narrow down strategies and tactics								
Qualitative and quantitative evaluation of tactics								
Assess complementarity with existing Hawaii policies, plans and budgets								
Second Transportation Sector Workshop - seek working agreement on plan and implementation steps								
Final report								

2 Hawaii Transportation Energy: Review and Outlook

In 2013, Hawaii's transportation sector consumed the energy equivalent of roughly 800 million gallons of gasoline (Figure 1). Ground transportation accounted for 65 percent of this total, with the remainder consumed by aircraft and marine vessels.

¹ See Annex IV for a complete list of attendees.

2013 transportation energy use: ~800 million gallons

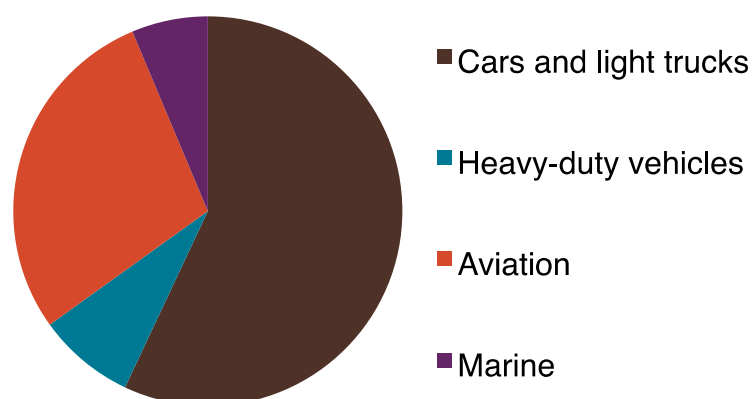


Figure 1. Transportation energy use² in Hawaii, 2013 (ICCT, 2014; DBEDT, 2014a; DBEDT, 2014b)

The 2011 edition of the HCEI Roadmap did not consider fuel use in the aviation and marine sectors, and instead laid out four strategies to achieve a 70 percent reduction in petroleum use from ground transportation, equivalent to roughly 385 million gallons per year (MGY) by 2030. These strategies included reduction in vehicle-miles traveled (VMT), expansion of renewable fuels, improved vehicle fleet efficiency, and expanded market share of electric vehicles (EVs)³. To achieve such an aggressive goal for reducing ground transportation petroleum use, the 2011 Roadmap established interim targets for each of the four strategies; these near-term and mid-term targets are compared with recent progress in Table 2.

Table 2. Comparison of 2015/2020 goals with 2013 status

Strategy with 2010 baseline	2015 target	2020 target	2013/2014 Actual
Reduce vehicle miles traveled (VMT)	2% VMT reduction	4% VMT reduction	19% increase in VMT
Incorporate renewable fuels into transportation sector	E10 and biodiesel consumption at 2010 level		52 million gallons
Improve standard vehicle efficiency of fleet	25 mpg cars 18 mpg LT	30 mpg cars 22 mpg LT	25 mpg for cars & LT combined
Accelerate the deployment of EVs and related infrastructure	4K EV sales (10K on road)	10K EV sales (40K on road)	1K EV sales (3K on road)
On-road fuel use of 496 MGY in 2010	–	–	525 MGY in 2013 (6% increase)

Reduce vehicle miles traveled (VMT)

The initial HCEI included a relatively narrow set of transportation stakeholders, many of whom specialized in alternative fuels and electric-drive vehicles. While the HCEI Roadmap did target a reduction in statewide VMT (2 percent reduction from 2010 by 2015), this target was not taken up across the government agencies responsible for managing travel demand.

² Marine estimated based on share in DBEDT (2014a). Aviation based on DBEDT (2014b). Cars, light trucks, and heavy-duty vehicles estimated in ICCT (2014) based on gasoline and diesel use in DBEDT (2014b).

³ The term "electric vehicle" (EV) includes battery electric (BEV) and plug-in hybrid electric (PHEV) vehicles; this definition is commonly used in existing legislation (Hawaii State Legislature, 2009) and plans (HCEI, 2011) in Hawaii. The term "electric drive vehicle" (sometimes abbreviated "edrive") typically includes hydrogen fuel cell electric vehicles (FCEV) in addition to BEV and PHEV.

A lack of coordinated action towards the target, coupled with an economic recovery, led to a 19 percent increase in VMT from 2010-2013, making it unlikely that the state will reach the 2015 target.

Incorporate renewable fuels into transportation sector

The renewable fuels strategy in the HCEI Roadmap focused on increasing the volume of ethanol and biodiesel consumed in the transportation sector. The near-term biofuels target is expected to be met through ethanol imports to meet the state's requirement to blend 10 percent ethanol into motor gasoline. The long-term target of 150 MGY by 2030, however, is much more aggressive and needs to be re-evaluated based on feasible cost-effective pathways.

Improve standard vehicle efficiency of fleet

Of the four strategies, the outlook for vehicle efficiency has improved the most since 2010, thanks to federal CAFE/GHG rules established by the US EPA and NHTSA for passenger vehicles for model years 2012-2016 and 2017-2025, and for heavy-duty vehicles model years 2014-2018. These standards are expected to reduce the fuel consumption of new passenger vehicles by 42 percent from 2010-2025, and by 7-20 percent for heavy-duty vehicles from 2010-2017.⁴ Presently, the fleet average efficiency for cars and light trucks has exceeded the HCEI Roadmap's 2015 target, and Hawaii's vehicle fleet is expected to meet the efficiency targets through 2030 in the absence of action at the state level.


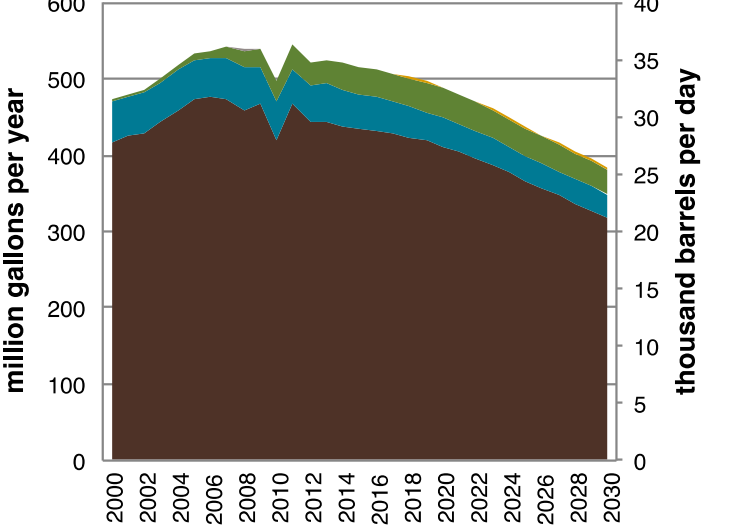
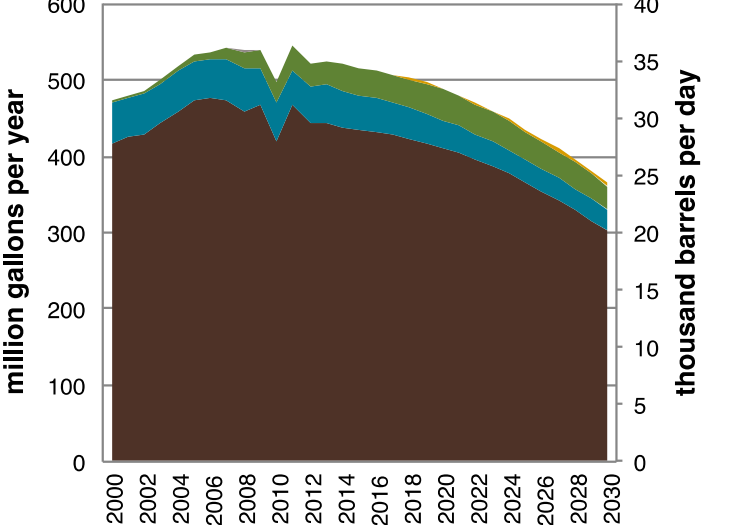
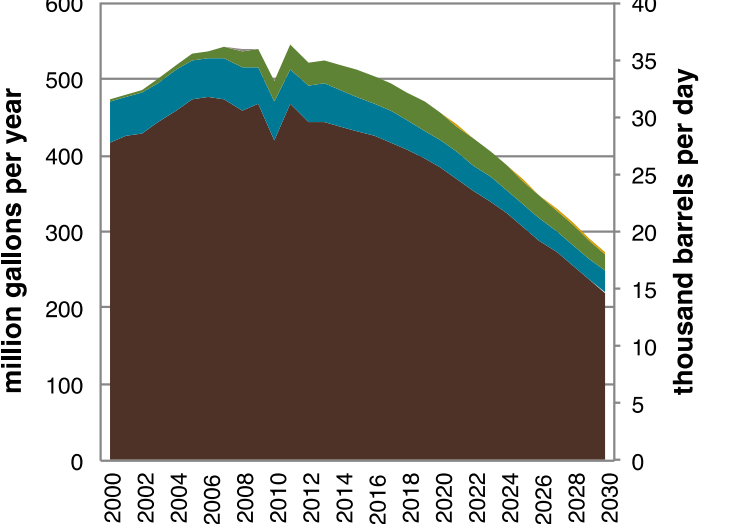
Accelerate the deployment of electric vehicles and related infrastructure

In the past several years, the State of Hawaii has made significant investments in enabling infrastructure for EVs. Now, there are 160 public charging stations (364 outlets) across Hawaii, and Hawaii is among the leading states nationwide in terms of the share of EVs sold. While the 2015 EV goals of 4,000 in sales and 10,000 on the road are unlikely to be met, the overall trend (increasing EV sales each year since 2010) is encouraging and indicates meaningful progress has been made by statewide actions.

In addition to assessing recent progress with respect to the HCEI Roadmap's near-term goals, the ICCT projected on-road transportation energy demand to 2030 under several different policy scenarios (Table 3). These projections illustrate that on-road transport energy consumption will decrease by more than 20% from current levels by 2030 based on current trends. Most of this reduction will be caused due to an increase in new vehicle fuel efficiency, along with a modest market penetration of EVs. Nearly 30% reduction from current levels can be achieved by 2030 assuming further increases in new vehicle fuel efficiency and EV market share. Only by coupling these advances in new vehicle efficiency and EV market shares with a reduction in VMT as envisaged by the HCEI 2011 roadmap can a greater than 50% reduction in petroleum consumption from current levels be achieved by 2030. Subsequent phases of the Transportation Industry Analysis project will involve quantifying the potential reductions from an expanded set of transportation tactics to be considered under a revised HCEI transportation plan.

⁴ TransportPolicy.net (2014)

Table 3. Hawaii statewide on-road transportation energy demand projections (ICCT, 2014)

	Scenario assumptions
	<p>Current trends</p> <ul style="list-style-type: none"> - 2025 LDV fuel economy standards are met - 2014-2018 HDV GHG standards - 5% BEV + 5% PHEV of new vehicle sales by 2030 (10% total EV) - Vehicle stock and total VMT grow 15% (at a 1:1 ratio with population) from 2013-2030
	<p>Potential policies for efficiency and electric drive</p> <ul style="list-style-type: none"> - 2030 fuel economy standards for LDV and HDV - 6% BEV, 6% PHEV, 3% FCEV of new vehicle sales by 2030 (15% total electric drive) - Vehicle stock and total VMT grow 15% (at a 1:1 ratio with population) from 2013-2030
	<p>Potential policies for efficiency, EV, and VMT</p> <ul style="list-style-type: none"> - 2030 fuel economy standards for LDV and HDV - 6% BEV, 6% PHEV, 3% FCEV of new vehicle sales by 2030 (15% total electric drive) - 8% VMT reduction target met by 2030

3 Breakout session highlights

Following the morning session in which the ICCT presented and offered for discussion the transportation sector analysis, the group split into two breakout sessions to discuss in detail the feasibility and potential impacts of petroleum reduction tactics related to 1) reducing VMT and 2) promoting alternative fuels⁵. Each session included a presentation of a list of tactics assembled from stakeholder recommendations (gathered in phone interviews and a survey prior to the workshop) and international best practices. Each session also included a worksheet to facilitate conversation and gather feedback on the tactics. Additional tactics were brought up in both sessions and were added to the respective worksheets. While the responses to the worksheets will inform the prioritization of tactics and subsequent recommendations, the highlights of the breakout sessions included in this report are based on the verbal content of each session (as summarized in the open discussion and wrap up held at the end of the workshop).

Managing Travel Demand

In Table 3, the difference between the second and third panels demonstrates the importance of managing travel demand in meeting HCEI energy goals: if VMT is were to be reduced to 8 percent below 2010 levels by 2030, ground transportation energy demand would be over 80 MGY less than if VMT grows proportionally to population from 2013-2030.

In the breakout session on managing travel demand, the most common concern expressed by stakeholders was a need for a binding goal that would require coordination across government agencies and facilitate cooperation with non-government groups. While such a goal could take the form of mandatory reductions in greenhouse gas emissions or energy consumption in the transportation sector, a legislatively binding target to reduce statewide VMT received the strongest support. Such legislation has been adopted in five US states⁶ and could be supported with island-specific targets to increase the share of trips taken by bicycling, walking, and public transit. Such targets would require the coordination of long range plans for transportation and land use to reduce the need for travel (such as compact, mixed use, and transit orientated development) and increase access to alternative transportation options. Stakeholders consistently expressed a desire for better coordination with and support from the State DOT, especially relating to issues of financing and planning infrastructure for transportation alternatives such as bicycling, walking, and public transit.

Competitive application programs for federal funding under the Transportation Alternatives Program (TAP) were highlighted as a possible avenue to supplement current transportation funding in the state. In addition, some stakeholders suggested consideration of innovative transportation financing options such as VMT fees, congestion-pricing, or dedicating revenue from county-wide excise taxes to improve transit service and multimodal transport infrastructure.

In the breakout session, over thirty VMT reduction tactics were discussed including the following four tactics. Additional data gathering, analysis, and discussions with stakeholders will be conducted before a longer tactic list is finalized.

1. Replace the Level of Service (LOS) measurement of vehicle flow currently used in environmental impact assessments for potential infrastructure projects with a measure of VMT. This has been pioneered in the State of California and use to promote projects for multimodal transportation and transit orientated development (TOD) that are consistent with the State's vision to reduce VMT and related energy use.

⁵ Tactics relating to vehicle efficiency, electric drive vehicles and fuels, and marine and aviation will be addressed in follow-up meetings and webinars.

⁶ New York, Massachusetts, Oregon, Washington, and Vermont. Source: ACEEE (2014)

2. Propose and adopt a legislative bill to take advantage of commuter benefits that are allowed under the federal tax code but that are not yet utilized across the state. Such a bill could require large employers to offer one or more monthly benefit options (e.g. pre-tax benefit, subsidy, or free transit service) to employees who commute by alternatives to driving alone.
3. Building off of potential statewide legislation for commuter benefits, provide State and County support of travel demand management (TDM) programs both within government agencies and for large employers.
4. Explore carsharing of government fleets to reduce costs and improve the efficiency and utilization of these fleets; consider also providing additional dedicated parking for carsharing programs.

Alternative Fuels

The alternative fuels session discussed biofuels as well as natural gas pathways for displacing petroleum use from the transportation sector.

While imported ethanol currently accounts for the vast majority of biofuels consumed by Hawaii's transportation sector, fuels that were identified as having the greatest value to the State are those that are domestically produced and renewable. In particular, two fuel pathways were identified as meriting additional consideration:

1. Biogas has potential to offset in petroleum use in heavy-duty vehicle fleets, including trucks and buses. Producing domestic biogas (and compressed biogas) would likely require a production tax credit as well as simplified permitting pathways for biogas projects. As with the other fuels pathways, additional research is needed to evaluate the potential volume and cost of producing biogas domestically. One of the primary steps in this direction is to create a statewide inventory of biogas availability for potential use in transportation sector.
2. Biodiesel already is produced domestically; however much of it is currently used for power generation. One means of utilizing biodiesel for transportation and boosting production volumes would be to pass a B5 mandate requiring that 5 percent biodiesel is blended into on-road diesel sold throughout the state. Such a mandate could also provide sufficient economies of scale for fuel producers to invest in distribution infrastructure. Offering a production tax credit could help limit any increase in fuel costs to fleet operators.

In addition to the specific fuel pathways identified above, it was brought up that biofuel pathways should also be considered for the aviation and marine sectors; however, such pathways are likely at an earlier stage and would require long-term support to bring about significant reductions in petroleum use.

Representatives from Hawaii Gas and Hawaiian Electric noted that there might be potential to use natural gas as a transport sector fuel in Hawaii in a post-2020 environment. Some of the stakeholders expressed skepticism about trading dependency on one fossil fuel (petroleum) for another (natural gas), while others expressed the diversification benefit of natural gas. The ability to generate hydrogen from natural gas was noted as well. Hydrogen also has significant potential as a long-term, renewable transportation energy carrier in Hawaii. HNEI has developed an infrastructure roadmap for hydrogen fuels that will be presented for discussion in a follow-up meeting focused on electric drive⁷ vehicles and fuels.

4 Conclusions

The first Transportation Sector Workshop offered a valuable opportunity to build awareness across a broad stakeholder group of the intended process for developing a revised HCEI

⁷ Includes battery electric, plug-in hybrid, and hydrogen fuel cell vehicles and fuels.

transportation plan. While the breakout sessions yielded many insights that will be helpful to setting objectives, prioritizing transportation tactics, and laying out implementation steps, it is evident that the potential for success of the revised transportation plan lies in continued engagement and collective action of a broader set of stakeholders than was initially envisioned in 2011. In the near term, this engagement will continue with the upcoming workshop on electric drive vehicles and fuels, as well as web-meetings on select topics such as vehicle efficiency, aviation and marine energy efficiency options.

Annex I – Glossary

B5 — Diesel fuel with 5 percent biodiesel blended in
BEV — Battery electric vehicle
CNG — Compressed natural gas
DBEDT — Department of Business, Economic Development, & Tourism
EV — Electric vehicle, including battery electric and plug-in hybrid electric vehicles
FCEV — Fuel cell electric vehicle
HCEI — Hawaii Clean Energy Initiative
HDOT — State of Hawaii Department of Transportation
HDV — Heavy-duty vehicle, including trucks, buses, and vocational vehicles class 3-8
HNEI — Hawaii Natural Energy Institute
ICCT — International Council on Clean Transportation
LDV — Light-duty vehicle, including cars and light trucks class 1-2
LT — Light truck
MGY — Million gallons per year
MPG — Miles per gallon
NHTSA — National Highway Traffic Safety Administration
PHEV — Plug-in hybrid electric vehicle
TDM — Travel demand management
TOD — Transit orientated development
VMT — Vehicle-miles traveled
US EPA — United States Environmental Protection Agency

Annex II – References

- American Council for an Energy-Efficient Economy. (2014). Executive Summary, 2014 State Energy Efficiency Scorecard. Retrieved from <http://www.aceee.org/state-policy/scorecard>
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- TransportPolicy.net (2014). The International Council on Clean Transportation & DieselNet.
- US: Light-duty: Fuel Economy and GHG
 - US: Heavy-duty: Fuel Consumption and GHG

Annex III – Workshop Materials

First Transportation Sector Workshop Morning Documents [PDF]

- Final workshop agenda
- Welcome and Introduction to HCEI [Presentation] – Mark Glick (DBEDT)
- Transportation Sector Review [Presentation] – Anup Bandivadekar (ICCT)

First Transportation Sector Workshop Afternoon Documents [PDF]

- Breakout Session 1: Managing Travel Demand [Presentation] – Joshua Miller (ICCT)
- Breakout Session 1: Managing Travel Demand [Worksheet]
- Breakout Session 2: Alternative Fuels [Presentation] – Anup Bandivadekar (ICCT)
- Transportation Survey – For the time being, the transportation survey is still accepting new responses at: <http://tinyurl.com/HCEI-trans>

Annex IV – Transportation Sector Stakeholder Workshop Attendees List November 13, 2014

Last Name	First Name	Organization
Alexander	Daniel	Hawaii Bicycling League
Amina	Kawakahi	US Pacific Command (USPACOM)
Azari	Nick	Arion Energy
Bandivadekar	Anup	International Council on Clean Transportation
Barnes	Cecily	Hawaiian Electric Co.
Campaniano	Robin	HCEI
Chiba	Yuko	Enterprise Honolulu
Chin	Jonathan	DBEDT
Choi	Song K	University of Hawaii at Manoa
Coffman	Makena	UH Manoa
Cole	John	Hawaii Natural Energy Institute
Dancil	Keiki-Pua	Hawaiian Electric
DeAlmeida	Carlos	Hawaii Independent Energy
Doi	Warren	Energy Exceleator
Espiritu	Justine	EV Structure
Ewan	Mitch	HNEI
Finch	Jeff	Aloha Petroleum, LTD.
Fischer	Liz	USDOT
Fukunaga	Kay	NextEra Energy
Gaug	Greg	Ulu pono Initiative
Glick	Mark	DBEDT
Harimoto	Breene	Legislature
Ignacio	Jay	Hawai'i Electric Light
Jakeway	Lee	Hawaiian Commercial & Sugar Co.
James	Rachel	State of Hawaii
King	Robert	Pacific Biodiesel Technologies
Kishimura	Toshiji	Kishimura Industry LLC

Kvam	Erik	Renewable Energy Action Coalition of Hawaii
Larson	Margaret	DBEDT
Law	Bryan	U.S. Navy
Lawlor	Shem	Blue Planet Foundation
Liu	Creighton	Hawaiian Electric Industries
Lloyd	Alan	International Council on Clean Transportation
Miller	Joshua	International Council on Clean Transportation
Nagamine	Ginger	Oahu Transit Services, Inc.
Perez	Carlos	Hawaiian Electric Company, Inc.
Picardo	Caterine	KUPU
Ritter	Todd	Honolulu Clean Cities
Rocheleau	Rick	Univ of Hawaii
Rolf	David	Hawaii Automobile Dealers Association
Salim-Hagihara	Germaine	Public Utilities Commission
Schafer	Clarice	Hawaii Energy Policy Forum
Shim	Pono	Enterprise Honolulu
Shimoyoshi	Yoko	Hawaii Clean Energy Foundation
Sihler	Katie	RideScout
Simonpietri	Joelle	US Pacific Command (USPACOM)
Sosh	Virginia	C & C of Honolulu
Sparlin	Kym	DBEDT
Speas	Kurt	Tony Nissan
Strickler	Joshua	Hawaii Gas
Sullivan	Benjamin	County of Hawaii
Tanata	Lance	Hawaii Independent Energy, LLC
Taniguchi	Chad	Hawaii Bicycling League
Teshima	Eric	Kishimura Industry LLC
Togami	Tadahiro	Hitachi
Turn	Scott	University of Hawaii
Viray	Lynda	DBEDT
Wallsgrove	Richard	Blue Planet Foundation
Yajima	Tiffany	Ashford & Wriston, LLP
Yao	Jimmy	Hawaiian Electric Company, Inc.
Yeary	Asia	EPA
Yukimura	JoAnn	Kauai County Council