



Sustainable Transportation Solutions: Energy Use Impact

Murray Clay
Managing Partner

September 9, 2013

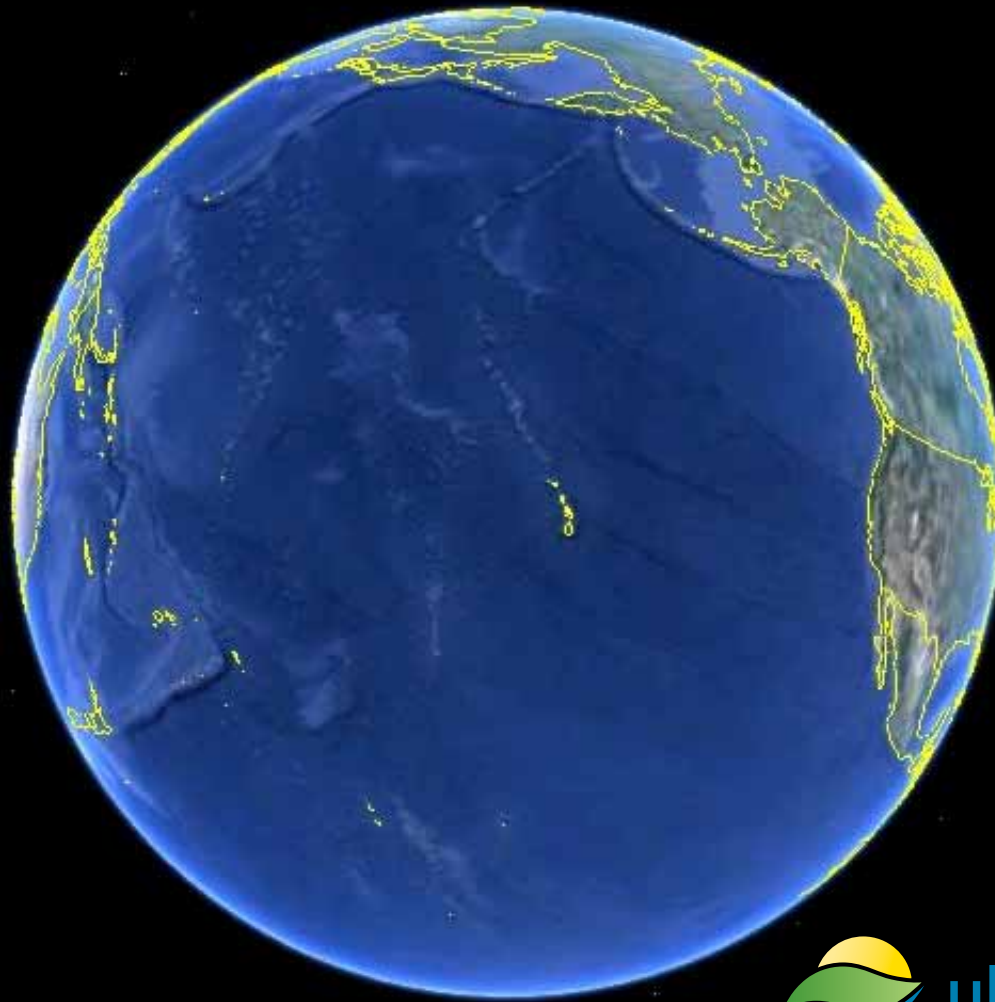


Hawai'i – Earth's most isolated land mass has reason to be more self-sufficient

91% reliant
on food
imports

93% reliant
on imported
energy

Limited space
for waste
disposal



What is the Ulupono Initiative?

- We are a Hawai‘i-focused impact investment firm that uses for-profit and non-profit investments to improve the quality of life for island residents in three key areas:



*Our Founders:
Pam & Pierre Omidyar*



**More Locally
Produced Food**



**More Renewable
Energy**



Waste Reduction

Ulupono Initiative: Long-Term Goals

	2010	2015	2020	2030
% total energy produced locally ¹	4.1%	15%	30%	60%
% food grown locally (expenditures)	8% ²	15%	20%	30%
% total waste diversion ³	56% ³	65%	70% ⁴	85% ⁵

¹ Net of efficiency improvements

² Based on 2008 State of Hawai'i Agriculture Statistics

³ Hawai'i Department of Health Office of Solid Waste Management 2010; Opala.org, Total Waste Stream O'ahu, 2010

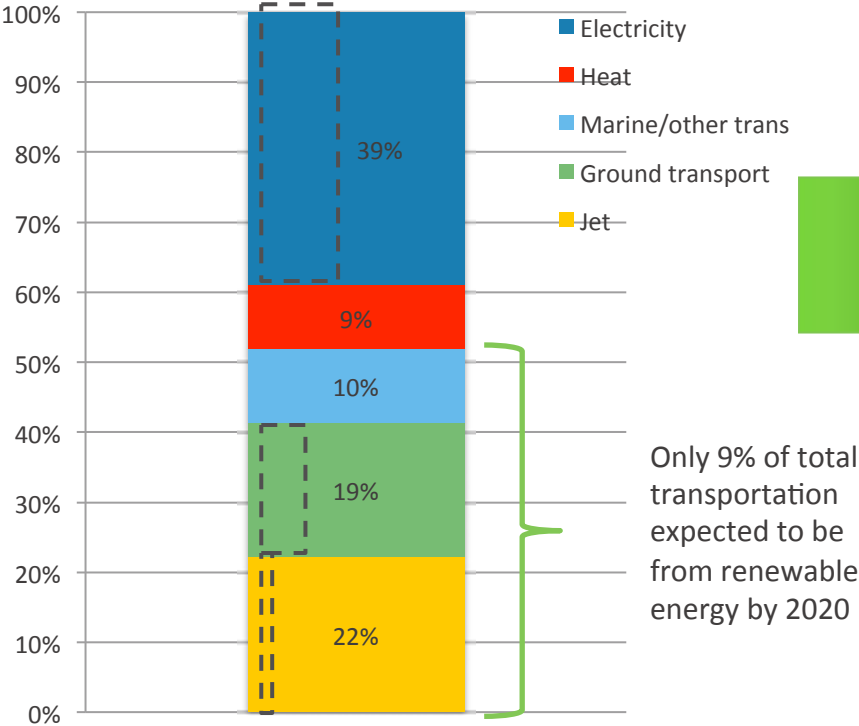
⁴ Assumes H-POWER runs at full capacity (900K tons) due to inter-county aggregation of burnable waste; Hawaiian Earth Products (anaerobic digester & composting) & Honua Power divert 246K

⁵ Includes addition of nine projects on O'ahu diverting an additional 386K tons as identified by Cascadia report (2011)

How Can We Close the Gap on Our Energy Goals?

- Transportation expected to consume about 51% of total energy, electricity estimated to be roughly 40%

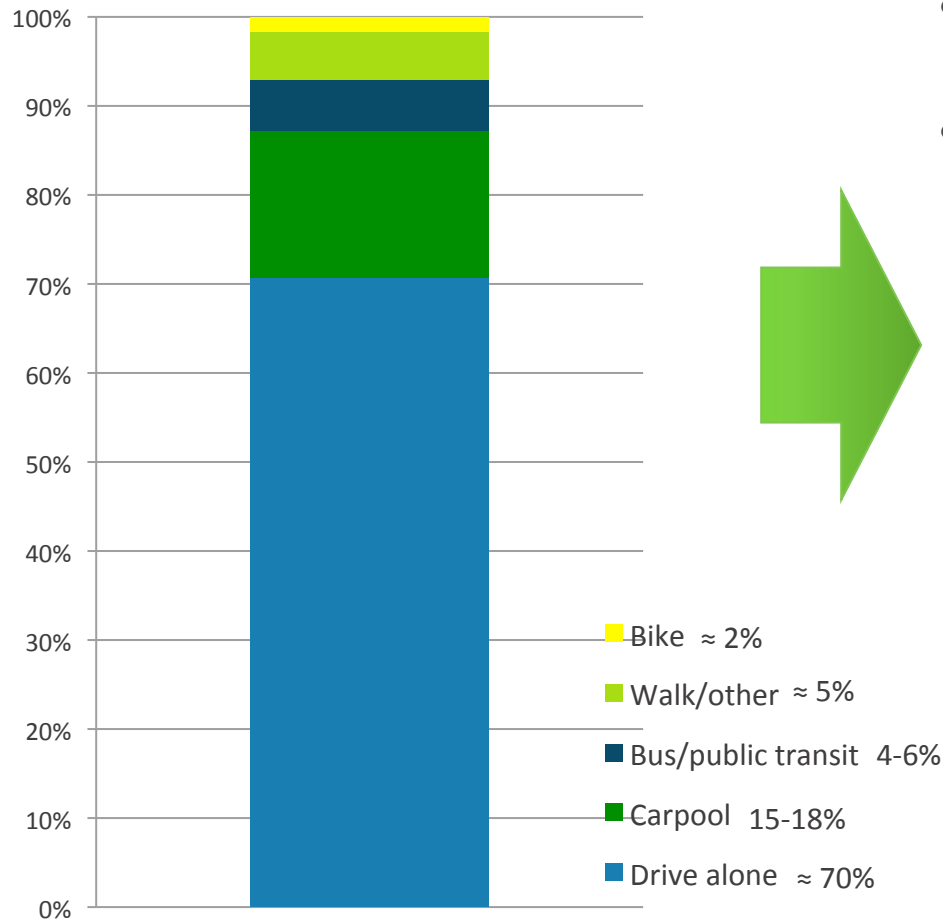
2020E Total Energy Consumption



- Close the gap with options specific for each sector:
 - Renewable electricity comes from a number of technologies (e.g. solar, wind, geothermal, biomass, ocean, etc.)
 - Renewable fuel for jet and marine/ other transportation is currently only feasible through biofuels
 - Ground transportation fuel can come from EVs or biofuels
 - Ground transportation can also come from a change in modality and/or vehicle efficiency

[] - Indicates expected amount from renewable energy per Ulupono internal analysis

Modality Choices – Why Drive?



- 60-70% of Hawai'i commuters drive alone
- Shifting 10% of commuters to other modes could save 4% of ground transportation fuels & 1% of total energy
 - At a cost of \$5.3 billion, rail is only expected to shift 1% of drivers¹
 - Bike: Increase penetration from under 2% to 5% for \$68 million²
 - Walk/other: Increase by 2% points, helped by transit-oriented development (approaching best-in-class U.S. cities)³
 - Carpooling: Increase by 2% points (approaching best-in-class U.S. cities)³
 - Bus/other public transit: Increase by 2% points (restore previous ridership levels)⁴

1) <http://www.honolulutransit.org/rail-system-guide/facts-and-figures.aspx>

2) O'ahu Bike Plan

3) <http://www.usnews.com/news/best-cities/articles/2011/07/12/the-10-cities-with-the-most-earth-friendly-commuters>

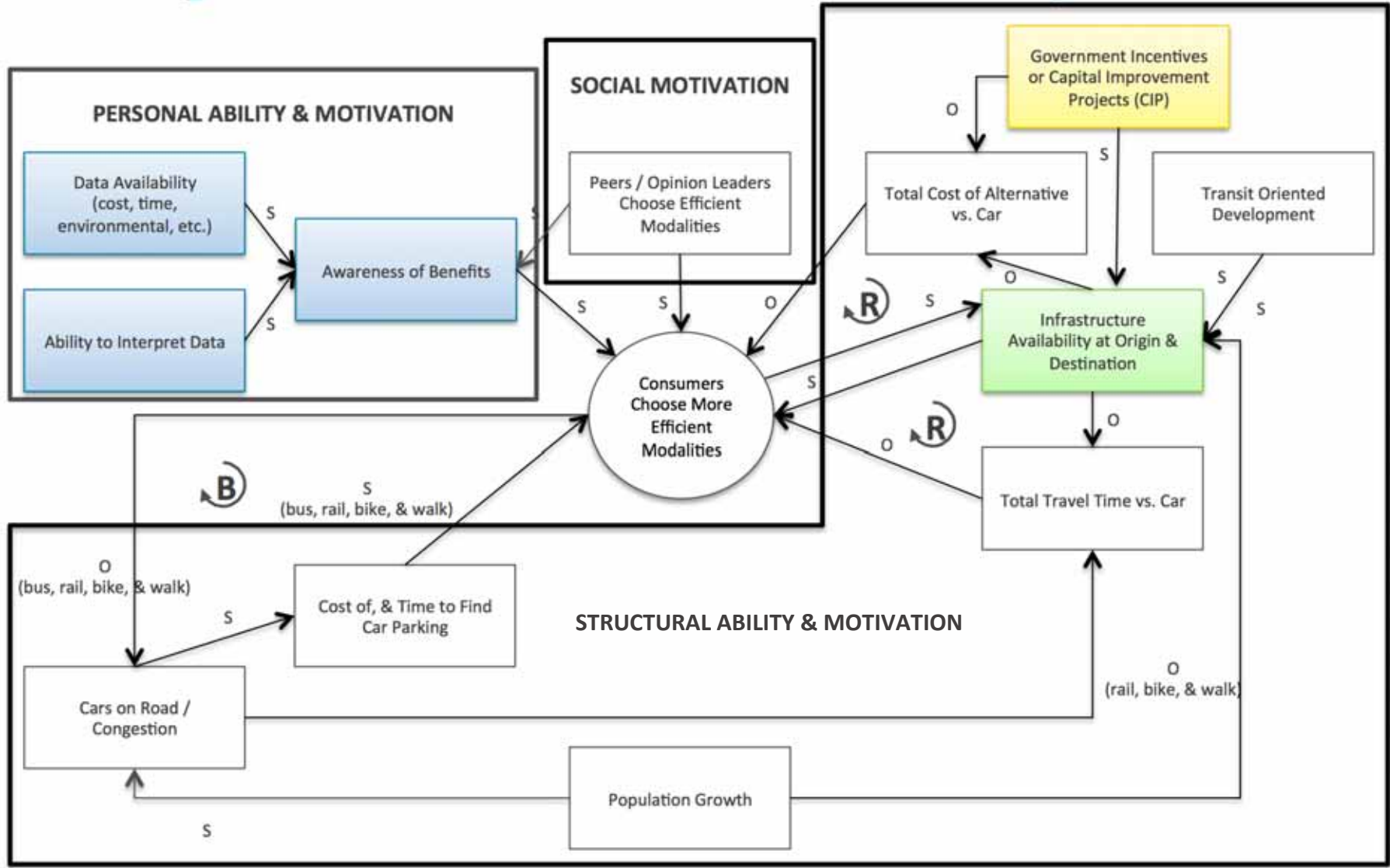
4) <http://the.honoluluadvertiser.com/article/2010/Feb/15/In/hawaii2150350.html>

Modality Choices – More Efficient Vehicles

- Light vehicle fleet efficiency is driven by the value proposition of new technologies, government incentives, and capital stock turnover
- Electric vehicles may rise from 1.4% of new cars to 5-15% by 2020 (expectation is 10% within 10 years of initial introduction)
- Technology shifts that leverage existing infrastructure still take 12-15 years to go from 10% to 90% penetration, primarily due to capital stock turnover
- Therefore, the focus of market and policy intervention should be to achieve the first 10% as rapidly as possible
- In ground transportation, we can catalyze public/private partnerships between the utility, government, banks and investors that could create massive adoption of EVs by 2030
 - Massive EV penetration ($\approx 2/3$ of vehicles) by 2030 could decrease ground transportation fuel demand by 50%, decrease total transportation fuel demand by 20% and decrease total energy demand by 6%

2030 is a more realistic goal for ground transportation, because changes in consumer behavior and vehicle fleet turnover take 15+ years, BUT we need to act now to ensure the right trajectory

Transportation: More Efficient Modality Choices



UI Potential Investment

UI 2013 Goal

UI Policy Work

Transportation-Related Ulupono Investments



20 MM gallons of biofuel (2018)



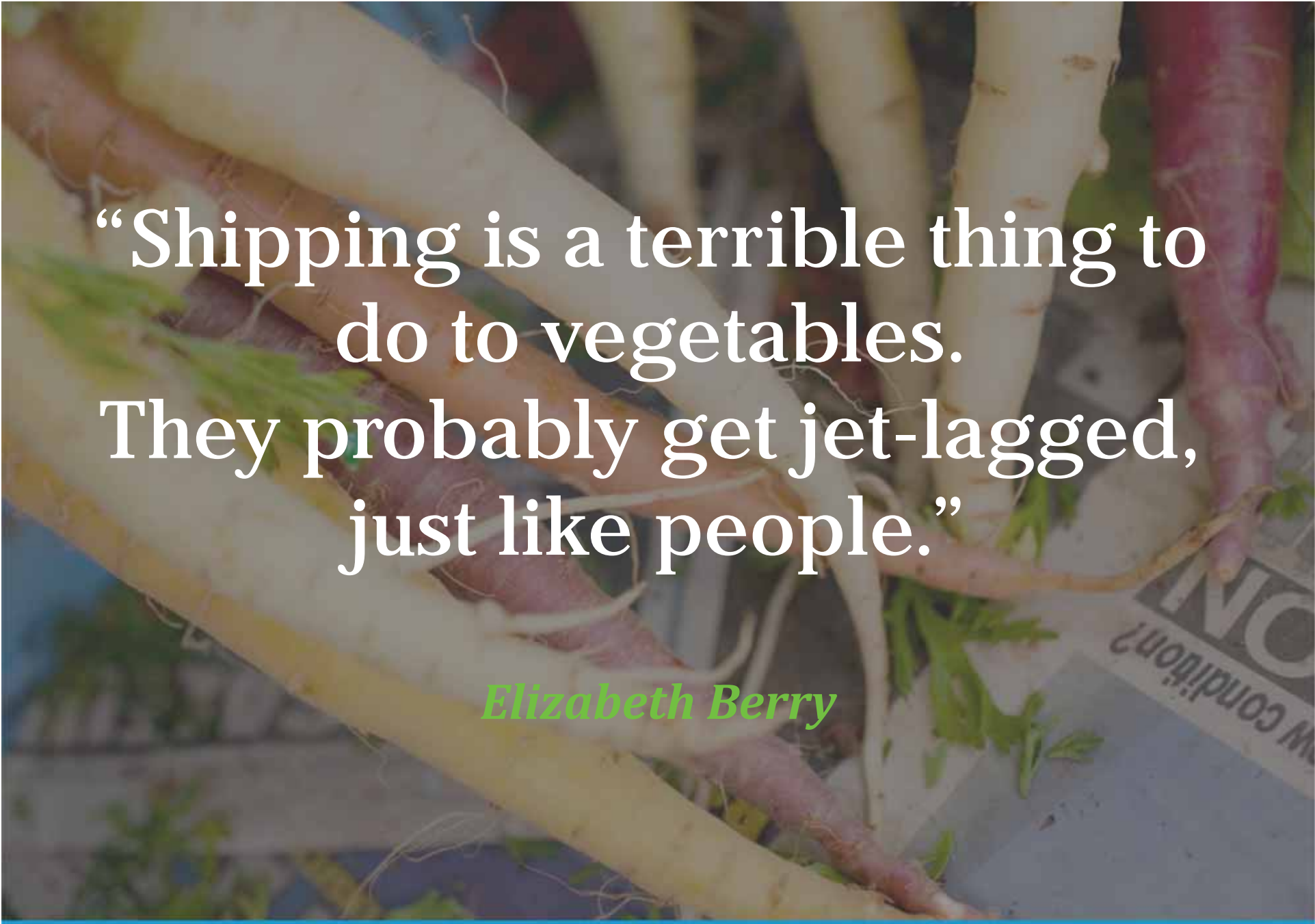
50 MM gallons of ethanol biofuel (2018)



30 EV charging station in Hawai'i by 2014



79 EV charging stations currently in Hawai'i



“Shipping is a terrible thing to do to vegetables. They probably get jet-lagged, just like people.”

Elizabeth Berry

Mahalo!



For more information, please call 808-544-8960 or email communications@ulupono.com.