Hawaii Clean Energy Initiative Transportation Energy Analysis

Executive Summary
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Prepared for:

Hawaii Department of Business, Economic Development & Tourism

Hawaii State Energy Office

Submitted by:

Executive Summary

In 2014, the Hawaii State Energy Office (HSEO) convened energy and transportation stakeholders to update plans for significantly reducing the consumption of petroleum products in Hawaii's transportation sector. The International Council on Clean Transportation (ICCT), an organization that leverages the collective expertise of a global network of specialists to promote policies for clean, efficient transportation, was procured to provide underlying assessments, analysis, recommendations, and stakeholder engagement to support the development of a new energy plan for transportation under the Hawaii Clean Energy Initiative (HCEI). The ICCT conducted a series of stakeholder consultations offering for consideration a new set of transportation options, and recommendations to reduce consumption of petroleum-based fuels in the transportation sector, including aviation, ground and marine transportation.

Development

The ICCT began the Transportation Energy Analysis with over 40 phone interviews of local stakeholders to gather insights on recent progress, relevant data, suggested policy options, and a future outlook of Hawaii's transportation sector. After developing a master list of nearly 100 potential tactics that could contribute to reduced petroleum consumption in the transportation sector, the ICCT developed a short list of 38 tactics for consideration for further review by transportation stakeholders for inclusion to an updated HCEI Energy in Transportation roadmap. Based on current conditions, ICCT evaluated the short list of tactics according to their petroleum benefits, costs, social acceptability, and likelihood of implementation, as well as several additional indicators. The evaluated tactics were presented and refined within a series of webinars and in-person meetings with participation from over 100 stakeholders from Hawaii and other U.S. states, and then ranked using a rigid framework to ensure transparency in the ICCT's primary and secondary recommendations.

Primary and secondary targets are recognized if they are likely to have:

- Measureable petroleum reduction benefits
- Monetary savings that outweigh the costs of implementation
- Social acceptability
- Likelihood of implementation

Table 1. Potential petroleum reduction in 2030 with recommended tactics

Sub-sector Tactic	Recommendation / Potential petroleum reduction in 2030 (MGY)
Vehicle Efficiency	**~24 MGY**
Federal vehicle fuel economy standards	16
High efficiency taxis	3.6
Procure EVs and efficient vehicles for public fleets	0.4 to 1.0
Green freight	1.1
Vehicle retirement incentives for low-income groups	1.1
Rental car efficiency program	1.4
Feebates for vehicle fuel efficiency	
Replacement tires	
Vehicle-Miles Traveled	**29 to 34 MGY**
Transit-oriented development	23
Infrastructure for alternative transportation modes	with above
Gasoline and diesel taxation	
Carsharing for public fleets	0.3 to 1.1
Dedicated parking for carsharing	1.2 to 1.7
Secure state support and funding of bikeshare programs	0.14
Commuter benefits legislation	0.7 to 3.6
Support of TDM by large employers	with above
Telecommuting by public employees and large employers	3.9 to 4.9
Flexible scheduling for work and classes	with above
VMT pricing program	
Price parking to recoup costs and promote alternative	
Electric-Drive Vehicles	**< 1 MGY quantified**
State rebates for electric-drive vehicles	242 gal/EV
EV rental prioritization for state and county employees	0.024 to 0.034
Time-of-use and EV charging rates	242 gal/EV
Promote government, private, and commercial hydrogen	
Support economically viable hydrogen fueling infrastructure	
Alternative Fuels	**–**
Cellulosic biofuel	
Sugarcane ethanol	
Support the consumption of CNG and LNG in vehicles	
Aviation	**7 MGY**
Financial support for winglet retrofits	4
Airport infrastructure support	3
Financial support for aircraft fleet renewal	
Increase the barrel tax	
Fuel efficiency-based landing charges	
Consumer information such as airline fuel efficiency ranking	
Marine	**2 to 7 MGY**
Slow steaming	0.8
Propeller polishing and hull cleaning	1.5 to 6.0
Increase bunker fuel taxes under the barrel tax	
Onshore power	
Total recommended (22 tactics)	**62 to 72 MGY**

LEGEND

Primary Target	Secondary Target	Monitor for Changes	Conduct Additional Research

Targeted Tactics

Of the 38 tactics evaluated, 22 tactics were recommended with either primary or secondary priority. In total, the recommended tactics could reduce petroleum use by 62 to 72 million MGY 2030 (Figure 1). Tactics to reduce vehicle miles travelled (VMT) and improve vehicle efficiency account for most of this potential, and those targeting aviation and marine account for 7% and 5%, respectively. The analysis provided allows the evaluation of tactics to be refreshed in response to changes in conditions of the assumptions. The list of targeted tactics is expected to grow if additional analysis is conducted that incorporates broader energy ecosystem benefits including the electric sector and Hawaii's energy economy.

Near term steps for identified tactics are addressed in the Implementation section. In addition these tactics will be rolled into a comprehensive energy roadmap developed by the HSEO that integrates the transportation, electric and residential, commercial and industrial sectors.

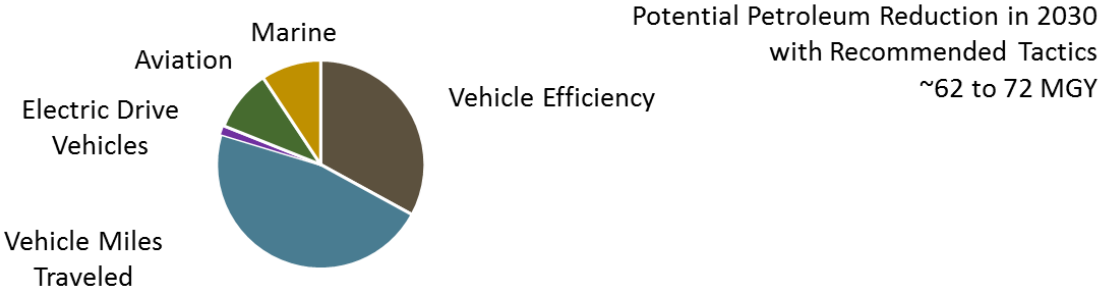


Figure 1. Quantified petroleum reduction in 2030 with recommendations by sub-sector

**note: A majority of electric-drive vehicle MGY reduction is captured in the revised baseline in Figure 2. Identified reductions in Figure 1 are incremental to the revised baseline reductions.*

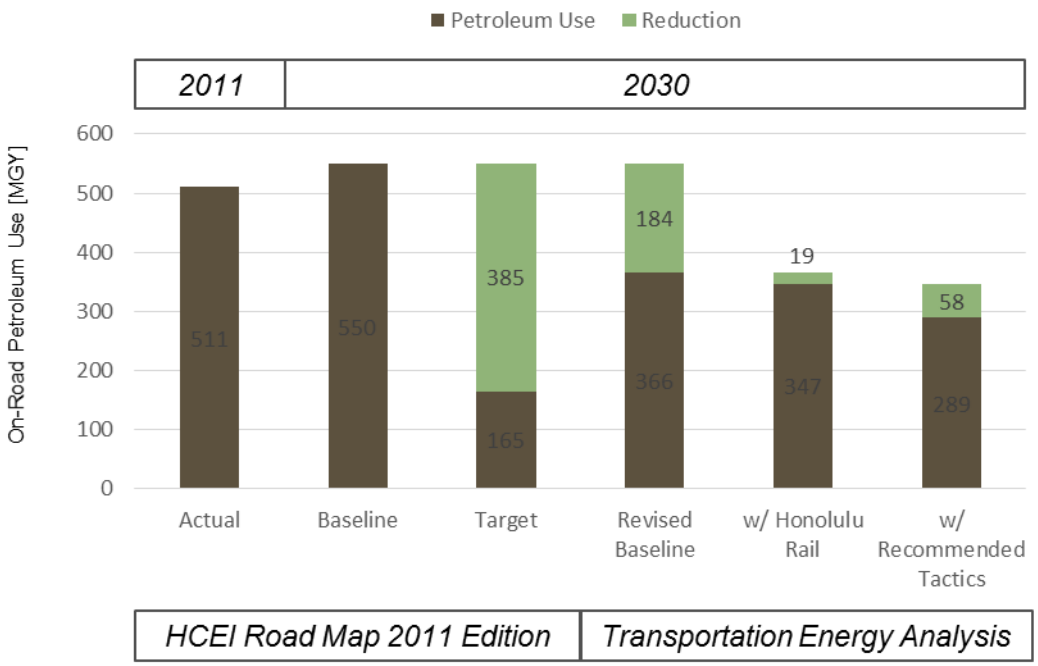
Identified Petroleum Reduction Potential in 2030

The ICCT considered recent policy developments to project on-road petroleum use in 2030. Recommended tactics in the report build on the new Transportation Energy Analysis baseline which is 184 MGY lower than estimated in the HCEI 2011 Road Map with the difference driven primarily by the following assumptions:

- New vehicles sold in Hawaii meet federal fuel economy standards for light-duty vehicles through 2025, and GHG standards for heavy-duty vehicles through 2018. These standards will reduce the fuel use of new light-duty vehicles by about 33% and heavy-duty vehicles by 5% to 13% compared to 2010 models.

- Sales of electric vehicles (EVs) increase to account for one in ten vehicles sold in 2030 (resulting in 43,000 EVs on the road).
- Total VMT increases in proportion to Hawaii's de facto population from 11.57 billion in 2014 to 13.40 billion in 2030 (assuming no change in per-capita VMT).
- Continuation of existing biofuel production and imports (including local production of 3 MGY biodiesel from waste fats).

Figure 2. Comparison of HCEI Road Map Target with Transportation Energy Analysis[1]



The Transportation Energy Analysis's recommended petroleum reduction tactics are intended to be updated with additional tactics periodically and reexamined to account for changing conditions of the criteria for selection. Moreover, this initial list is not the actual roadmap for action, but a scientific analysis of strategies and tactics that do not include all potentially beneficial and cost-effective actions. This report, therefore, provides a fairly comprehensive list of cost-effective, feasible actions that should be seriously considered by transportation and energy stakeholders for inclusion in a roadmap for action to advance Hawaii's clean energy goals in the transportation sector. New research and data for evaluation of additional tactics is essential, along with

[1] The 90 to 100 MGY of incremental petroleum reductions noted above result from the 86 MGY in ground transportation shown in Figure 1 above plus the 9 to 14 MGY identified in Figure 2.

continued refinement of analysis for evaluated tactics and assumption updates for changes in market conditions.

Implementation

With the conclusion of the Transportation Energy Analysis, the next step is for transportation and energy stakeholders to collaborate on an action plan framework and commit to carrying out specific actions. ICCT cites two lessons learned from successful approaches in California and other jurisdictions that may be applied to Hawaii and the HCEI energy in transportation roadmap[2]:

- The number one priority is to identify the responsible persons and Agency for implementation of the plan. To be successful, support for the plan would be needed from the Governor, legislature and key agencies including DBEDT, Hawaii Department of Transportation and City and County Governments.
- The recommendations must have the backing of the Governor and the legislature. One approach would be for this report to be used to create an Action Plan to be submitted to the Governor and the Legislature. This action plan will embody the recommendations included in this report.

Suggested next steps for each of the recommended tactics are as follows.

- Develop a plan with the additional details for implementation, including refined policy design, implementation schedule, explanation of costs and benefits, and funding considerations (if applicable).Implement any enabling actions that are necessary for the success of the tactic (for example, setting binding VMT reduction goals that align objectives across state and county agencies).
- Incorporate the work in the transportation sector within a comprehensive energy road map. The road map must take into account the interdependencies throughout Hawaii's energy ecosystem to identify requirements and innovations necessary to achieve state policy goals including achieving 100% renewable energy in the electric sector.
- For each tactic, designate a lead agency and a coordinator[3] that will be responsible for taking it toward implementation. This designation should ideally come from the Administration or the Legislature in order to ensure accountability to fulfill this responsibility. Critical functions of this role include developing a detailed implementation plan which includes the following steps:
    - Collect baseline data to support evaluation of impacts;
    - Commission research as needed to support policy development;
    - Engage with all stakeholders whose support is needed for implementation;
    - Conduct the education and public outreach to ensure social acceptability;
    - Monitor performance to demonstrate impacts once the tactic has been implemented.

[2] These successful approaches are described further in Section V.F. of the final report.

[3] Recommended tactics will require inter-agency and private sector collaboration, in addition to clearly defined roles and responsibilities.

Based on these suggestions, HSEO plans to oversee development of a draft implementation framework for the identified tactics in collaboration with key government agencies and stakeholders. HSEO will hold a follow up meeting in September 2015 in which the draft implementation framework will be vetted by stakeholders. Specific items include:

- Tactic leads
- Framework for leads to measure and report on tactic progress
- Method for socializing plan, results and resource requirements to key stakeholders including the Administration, legislature and State and County agencies in order to secure sustained support and necessary resources for implementation
- Process to update analyzed tactics for changes in market conditions and incorporate additional tactics into the roadmap

Tactic leads with support of their working groups will present tactic specific implementation plans by the end of the 4th Quarter of 2015.