Light Duty Electric Vehicle Adoption
Carbon Offset Symposium
Hawaii State Capitol Auditorium

April 10, 2019
We view EoT as a high priority—it has a significant impact on RPS, climate change, energy security, and grid modernization.

State RPS Goal only accounts for 28% of Petroleum use, while Transportation accounts for 61%.

- Other: 3%
- Military: 8%
- Heavy-duty vehicles: 7%
- Marine: 12%
- Aviation: 28%
- Jet Fuel: 28%
- Cars & Light Trucks: 53%
- Fuel for vessels: 7%

27.47% achieved as of Q3 2018.

We cannot go it alone—it’s a kākou thing.
Five near term action steps in our strategy...

<table>
<thead>
<tr>
<th>Near-term action steps</th>
<th>Hawaiian Electric Role</th>
<th>Partner Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boosting EV adoption by working with automakers, dealerships and advocates to lower the cost and educate customers</td>
<td><img src="image" alt="Green" /></td>
<td><img src="image" alt="Green" /></td>
</tr>
<tr>
<td>Accelerating the buildout of charging infrastructure, especially in workplaces and multi-unit dwellings. Providing a critical backbone of reliable, public utility-owned chargers as the launching point from which the broader electric transportation and third party market in Hawaii can expand and solidify. Identifying and providing make-readies in gap areas to create opportunities for third party chargers that optimize grid and customer locations to meet driver needs</td>
<td><img src="image" alt="Green" /></td>
<td><img src="image" alt="Green" /></td>
</tr>
<tr>
<td>Supporting bus operators in transitioning to electric with targeted outreach and programs that reduce the upfront cost and provide practical charging solutions</td>
<td><img src="image" alt="Green" /></td>
<td><img src="image" alt="Green" /></td>
</tr>
<tr>
<td>Creating grid service opportunities by leveraging demand response programs and rates that incentivize EV charging to align with grid needs and save money for both drivers and all grid customers</td>
<td><img src="image" alt="Green" /></td>
<td><img src="image" alt="Green" /></td>
</tr>
<tr>
<td>Coordinating with ongoing grid modernization and planning efforts to ensure smooth integration of EVs into energy delivery networks and maximizing use of renewable resources</td>
<td><img src="image" alt="Green" /></td>
<td><img src="image" alt="Green" /></td>
</tr>
</tbody>
</table>

We need everyone working together towards transitioning to this clean energy future
Broad-based inclusion of stakeholders
By 2045 we forecast that on O‘ahu one in two vehicles will be electric, on Maui ~ 60% and Hawai‘i Island ~40%.

Hawai‘i is rated #2 nationally for electric vehicle adoption per capita!
CO₂ emissions are forecasted to reduce significantly, slowing climate change and increasing energy security by importing less fossil fuels.
O‘ahu forecasted # of ports and charging infrastructure cost

Thought experiment for today

Forested public charging ports and light duty EV adoption

Charging infrastructure Cost Assumptions

1. EoT Roadmap page 147 filed March 2018
Charging infrastructure is ~ 24-30% of overall cost

Economic costs and benefits to O‘ahu per personal light duty electric vehicle, NPV 2018-2045

Non-managed charging

Net benefit: $2577 per vehicle

32% increase

Smart charging

Net benefit: $3401 per vehicle

Hawaiian Electric
Maui Electric
Hawai‘i Electric Light
Mahalo
For more information:
www.hawaiianelectric.com/GoEV