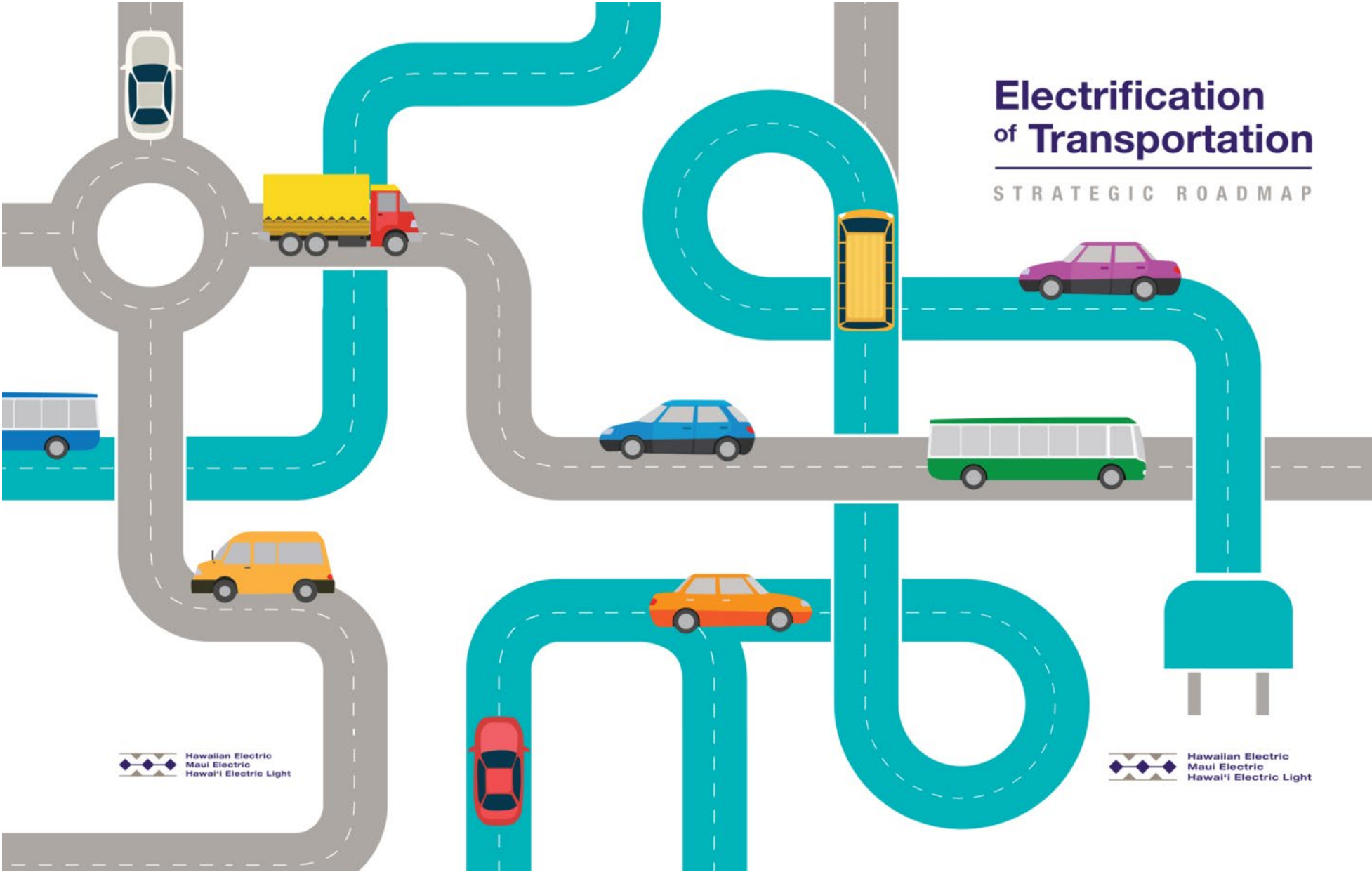




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Electrification of Transportation

STRATEGIC ROADMAP

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Key Takeaways from EoT Roadmap in 2018

-  Electrification of Transportation will help integrate renewable energy
-  Electrification of Transportation increases EV adoption, which slows down the effects of climate change and increases energy security
-  Electrification of Transportation in the long-term benefits all customers regardless if they own an EV or not



10 Proposed Near-Term Initiatives Hawaiian Electric Can Lead

Initiative #1	Work with partners to deliver <u>education and outreach</u> campaigns to drivers, dealerships, fleet managers, and taxi and TNCs
Initiative #2	Continue to <u>electrify Hawaiian Electric's own fleets</u> as availability of electrified vehicle technologies expands and total cost of ownership (TCO) comes down
Initiative #3	Work with partners to find ways to <u>lower EV purchase costs</u>
Initiative #4	Investigate and develop opportunities to lower customer bills in return for <u>"smart" charging</u> of vehicles and provision of <u>grid services</u> .
Initiative #5	Expand access to charging for customers living in <u>multi-unit dwellings</u> (MUDs) (i.e. condominiums and apartment buildings)
Initiative #6	Expand availability of <u>workplace charging</u>
Initiative #7	Expand availability of <u>public charging</u>
Initiative #8	Engage the <u>tourism industry</u> (via hotels, rental cars, TNCs, destinations)
Initiative #9	Encourage and enable electrification of <u>smart charging of buses</u>
Initiative #10	Encourage and enable electrification of <u>medium and heavy-duty vehicles</u> and off-road equipment as technologies mature and become commercially available at reasonable cost.



Leading by Example

Hawaiian Electric Companies' Fleet

Early fleet efforts

- 3 Hybrid to Plug-in Hybrid conversions in 2009
- First all-electric company Nissan Leaf sedan arrived on 3/18/11
- 2 Ford F-550 PHEV / Altec Industries AT-37G Trouble Bucket Truck in 2011

Current fleet (1300) – 36% AFV or hybrid

- 10% of class 1 (passenger) vehicles are plug-in
- 26 ePTO medium/heavy-duty trucks
- 4 plug-in medium/heavy-duty trucks
- 55 hybrids



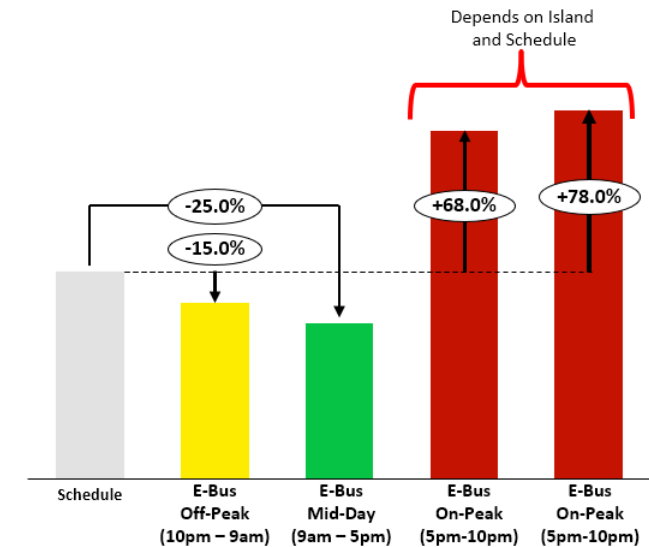
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Electric Buses

- Working with state, city, and private bus operators to help transition their fleet to electric
- Providing E-BUS pilot rates which provides lower energy and demand charges outside of On-Peak times



Energy Charges: **Discount** on Mid-Day and Off-Peak constant for all island and classes and **Premium** On-Peak ranges



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Electric School Bus Pilot in Partnership with EPRI

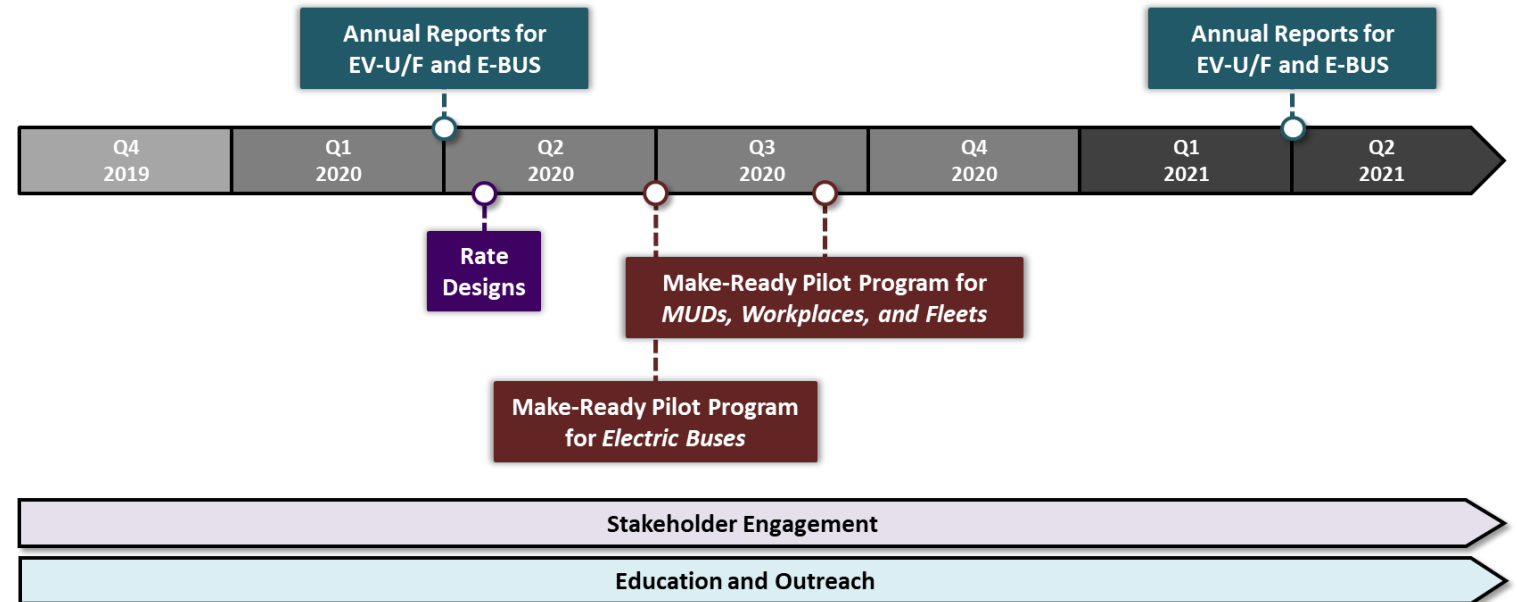
- In partnership with the Electric Power Research Institute
- Gather data to show effectiveness of day time charging
- Demonstrate electric school bus with DoE and private schools



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EoT Near-Term Workplan

- Rate Design request will include a commercial time-of-use rate
- Make-Ready pilot program will request utility installation and ownership of charging infrastructure from the grid, past the meter, up to the charge station
- Initial pilot targets fleets





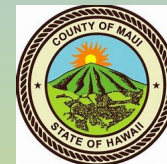
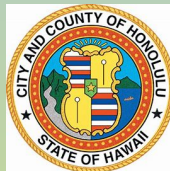
Drive Electric Hawaii seeks to promote the use of electric vehicles, cut fossil-fuel transportation and add more renewable energy through collaboration on education, promotion, advocacy and infrastructure to make electric mobility easier for all.



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