



Drive Electric Dialogue: Electric Bus Make-Ready Infrastructure Pilot Program Webinar

Questions & Answers

1. How do we contact the Hawaiian Electric team?

Please email eMob@hawaiianelectric.com to reach our team.

2. Is the pilot only for O'ahu?

The pilot is available for qualified bus operators in Hawaiian Electric service territory, which includes the counties of O'ahu, Maui, Hawai'i.

3. How much do electric buses cost?

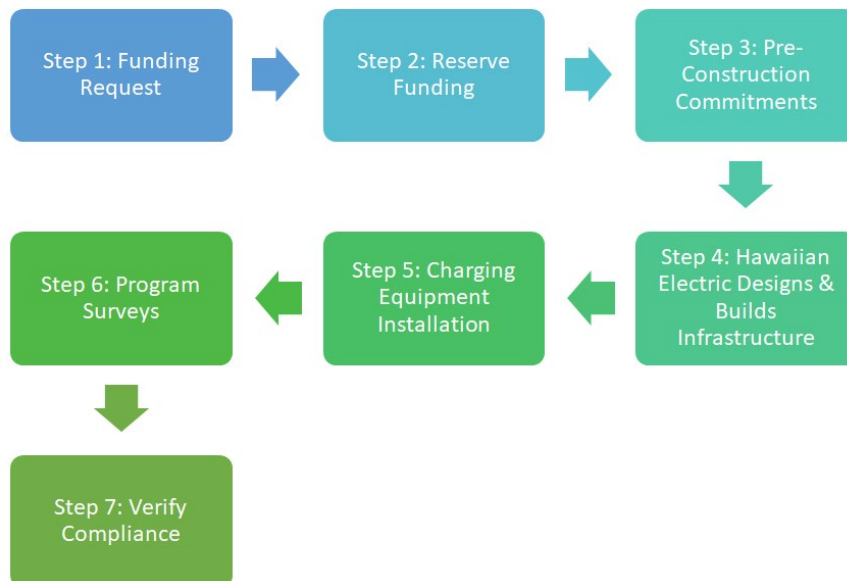
An average diesel bus is \$450,000-500,000. An electric bus can increase the cost by \$150,000-\$250,000. Cost typically increases with battery size.

4. Does this pilot include tour and school buses, medium- and heavy-duty vehicles?

This pilot is available to tour buses and school buses. We will be submitting three additional filings this year for a high capacity and commercial rate as well as a commercial make-ready pilot program, which can support commercial medium- and heavy-duty vehicles.

5. What is the process for entities to apply to participate in the program? How will proposals be evaluated?

The customer intake is under development. See the below diagram of the journey:





6. Have you looked at the impact of onsite owned/leased solar for eBus charging to improve the lifetime cost savings?

This is an interesting idea, and we think this pilot is an opportunity to observe customer behavior to see if there's an opportunity to stack onsite customer energy resources with bus charging. Our understanding that for most bus operators in Hawai'i, limited space is available to add additional power generation on their properties.

7. What can customers expect in terms of the cost per mile?

The cost per mile will depend on the rate and time of day the bus charges. If a customer uses eBus J, the midday rate is currently \$0.158965/kWh. With an efficiency of 2.2 kWh/mile for an average bus, the cost would be approximately \$0.35/mile.

8. Are we considering induction/wireless charging for the buses?

Customers can have flexibility in charger type. For example, the City & County has looked at the overhead pantograph for opportunity charging.

9. Are there opportunities for bus operators to enter public-private partnerships?

Yes, bus operators can explore creative financing tools like P3s.

10. How many eBus chargers there are in Hawai'i and who owns them?

Based on our conversations with bus operators in our service territory, we are aware of six eBus chargers. Please feel free to reach out to emob@hawaiianelectric.com if you are aware of others.

O'ahu Transit Services	1
Roberts Hawaii	3
JTB	2

11. How many buses in the Hawaiian Electric service territory?

From our research, we are aware of at least 7,050 registered buses in our service territory. There are some non-registered buses not reflected in the below chart.

	Non-Electric	Electric
O'ahu	4,260	8
Maui	1,319	0
Hawai'i	1,471	0

As of 4/11/2019

If you know of additional buses that might have been missed, please email us at emob@hawaiianelectric.com. We welcome the opportunity for this information to be centralized and more widely available.

12. What are the anticipated customer costs in terms of the eBus charging station and related equipment?

The costs will vary depending on what kind of charging station is installed (e.g. depot, overhead, DC, AC, etc.). [One study](#) indicated the cost was \$50,000. We've heard from



local bus operators that costs can vary from \$110,000-\$120,000 for 2 EVSE to \$160,000 for 1 EVSE. We hope to develop a better understanding of customer costs through this pilot.

13. Is there room to introduce smaller, cutaway electric vehicles?

These types of vehicles would not qualify for this program focused on electric buses.

14. How is Hawaiian Electric prioritizing which bus lines to electrify first?

The bus operators will have the flexibility to determine which buses to electrify and what routes they serve.

15. How are you thinking about load management in the context of this pilot?

This program pairs with the eBus rate to heavily incentivize utilization during the day. Customer can choose to manage loads on their sites using onsite batteries or other technologies. Hawaiian Electric is currently developing our aggregated demand response program creating another opportunity for customers to work with demand response aggregators to support load management.