Thank you for attending 'Funding the Transition to an Electric School Bus Fleet' on Thursday, June 25. Below are questions that were not answered during the webinar's **Q&A session**. This list is being updated as we hear more responses directly from panelists. If you wish to contact a specific OEM, or watch the webinar recording for questions answered during the webinar, visit ***empirecleancities.org/pastevents* or contact us at info@empirecleancities.org**

Question: Is V2G an option in locations where the utility does not have great need to relieve congestion (such as upstate NY)? Could you take the buses or their batteries to another location during the summer months that would be more advantageous for V2G?

Answer:

Highland Electric Transportation: V2G may not always be a good option if there is no support from a local / regional electric utility to incentivize it. Highland's model is malleable, in that, we've worked with school districts that involve Level 2 (19.2kW) simple, non-V2G. Having stated this, we absolutely will engage a district's utility, regardless, and if no incentives exist, we'll work with them with the hopeful intent they ratify a rate case that will allow for incentivization in the future.

Question: Can Highland Electric Transportation clarify how NYS SED Transportation Aid applies to the annual lease cost to the Districts?

Answer: Highland has spoken the NYS SED and they will provide aid similar to what is offered today through its formulaic funding process: "If lease payments are less than the life and cost of a school bus, the lease will be treated as an operating lease and will be aided accordingly." Highland engages its customers with an operations and lease agreement, which, according to the state will be capped at five-year periods; we will be seeking 5 + 5 (i.e., base five-year contract + one renewal = 10 years total), with an option for +5 (i.e., additional renewal + five years = 15 years total). Additionally, the infrastructure tied to the project will be another component that may be structured as a longer term beyond a capped five year renewal period. Ultimately, we are seeking long-term relationships with our customers.

Question: Do the battery packs need to be replaced? If so, how much are they?
Answers:

Highland Electric Transportation: The battery packs typically are good for 2,000-4,000 full cycle charges, depending on OEM product (i.e., varies by manufacturer), which equates to a 8-12+ year lifespan. As for replacement cost(s), Highland will carry extended warranty(ies) that provide coverage from 8-15 years, again, depending on OEM product. Further, any replacement costs during the time period the bus is under contract with Highland, we will be responsible for ALL COSTS associated with battery system maintenance and replacement—$0 to the district. As for battery system replacement cost(s), this too, will vary by OEM, so I'll defer to them on this.

Blue Bird: Battery packs will lose a capacity at 1% a year. At this time if a battery needs to be replaced it will be covered under warranty.

Motiv**:** Not likely. School buses are not used year-round and they have fairly low mileage routes when compared to other transportation applications. If so, how much are they? It's hard to say how much battery packs will cost in 5-10 years from now. Price of batteries is coming down fast. If customers need extra assurances then I implore them to contact Motiv to review the route profile and application. It's in no one's interest to put vehicles in the field that don't meet requirements or require expensive upgrades in the future.

Question: Are solar buses being manufactured and used in New York?

Answers:

Blue Bird: The Micro Bird Type A has a solar panel for starting and auxiliary use on the 12V system.

Motiv: Motiv's partner Trans Tech manufactures electric school buses in New York. Anyone can put a solar panel on top of a bus. But it won't do much for increasing your range and it will add cost to an already expensive bus. It would take days if not weeks to fully charge bus batteries with a small solar panel on the bus. We do have customers that power buses from a large solar array. I'm happy to share more info for those who are interested.

Question: Are the bus electric ranges affected by cold weather similar to EV passenger cars or worse?

Answers:

Blue Bird: All electric buses are affected by cold weather. Blue Bird has a dedicated thermal management system for the battery system to minimize the impact of cold climate.

***Motiv*:** Range reductions occur not just in cold weather, but also in hot weather. This is mostly due to HVAC loads for A/C and heat. Our type A school buses have a small cabin, so any effect cold or hot weather may have isn't as extreme as it might be on a large bus. Route profile and driver behavior are probably just as influential if not more than cold/hot weather. If you have any concern about the route profile or application - Please contact Motiv to review. It is in no one's interest to put buses in the field that won't be successful on their routes.

Question: What types of heating systems are being used on these school buses?

Answers:

Blue Bird: Blue Bird and Micro Bird buses are 100% zero emissions. This means that the heaters are electric. There are plans to have a .02 Nox propane heater to help aid in cabin heating.

Motiv: The energy for the heat is typically provided by our battery system and not fuel fired heaters. We put a hydronic heating system in the front and rear. The heat in the front comes through the Ford dash as it normally would. The body builder adapts their system to our rear heater and the fans blow heat into the rear cabin as they normally would. That being said - If you have a specific heating system you prefer we can discuss that too.

Question: What is the Battery System Voltage for each of these OEM models, 400V or 700-800V?

Answers:

***Motiv*:** 350V nominal, 400V peak.