Rural Transit Zero-Emission Vehicle Deployments:
Collaborating with your Electric Utility

November 5, 2019

Transit agencies across the country are replacing their diesel-fueled vehicles with battery electric or fuel cell electric vehicles. The electricity bill for a transit agency with a fully electric fleet will be a major operating cost. These costs are driven by the speed and timing of fueling, which introduces new challenges and opportunities for both transit agencies and electric utilities. Establishing strong partnerships between utilities and customers that are deploying large fleets of electric vehicles will ensure that everyone’s projects are successful.

During the webinar, Center for Transportation and the Environment (CTE) staff provided information about zero-emission bus (ZEB) technology, guidance on electrical usage and infrastructure needs to support ZEB deployments, as well as strategies that can help electric utilities and transit agencies build and maintain mutually beneficial partnerships throughout vehicle deployment projects.

The webinar also featured a case study presentation from how the Roaring Fork Transportation Authority (RFTA), in Aspen, CO partnered with their electric cooperative, Holy Cross Energy (HCE), throughout their battery electric bus deployment. RFTA is in the process of deploying 8 battery electric buses in their service area.

Access the webinar recording and PowerPoint.

Q: How successful is RFTA’s excess energy rate?  RFTA has a finite number of buses that already having a charging schedule.  Can RFTA really take the power?

A: These buses are consuming about 1.7-2.5 MWh per night, based on driving habits and ambient conditions. We have to forecast to schedule when energy excess happens 24-48 hours in advance. We'll start out by sending emails about when to charge.
Q: How long does RFTA run the electric buses during a typical day?

A: On a typical route, they last about 6-8 hours. That depends on how many laps they do and how short the route is. We assume that if we bring an on-route charger, it will extend the route. The 15 routes are about 10 miles a piece. That’s about 125-150 miles during our test days.

Q: Are buses located in mountainous areas able to run all day without stopping for a quick charge or switching to another bus?

A: This is still in a test phase. The buses can complete their routes now. We are going to have options of swapping electric with electric when need be to plug one into the routes that can. Right now, buses have to go back to the depot to charge. We’ve operated on cold days. When it gets cold it doesn’t react the same way. We have several routes that have steep grades where ski companies run. We have some basic data. The answer will be in the middle about optimal routes. Some routes are 8700 feet. Time will tell.

One challenge with operating electric buses in mountainous areas is related to regenerative braking. Regenerative braking allows you to “capture” some of the energy normally lost during braking and recharge the battery slightly. In mountainous areas, if an operator is not taking advantage of regenerative braking, the effects can be greater than they would be in a flat area. Additionally, sometimes in icy conditions a bus will turn off regenerative braking. This may reduce a vehicle’s range compared to when it is operated in dry conditions.

Q: When buses are charged overnight, does that require staff to be present to move or charge them?

A: Yes. RFTA is working with a charger with performance monitoring software, but right now it's manual. When we have sequential charging, it will remove some manual labor. To be a good grid citizen, you should know when to use electricity and when not to use it. Holy Cross is not impressed with "smart chargers." You can turn them off and on with your smart phone, but they don't have a feature to turn them off and on at a scheduled time.

Q: How feasible would solar energy on the transit facility work to fuel the chargers?

A: That's the next level - RFTA wants to obtain grants and do research on renewable energy. They may want to explore wind power and rooftop solar. Holy Cross is looking to develop a 5-megawatt solar farm in Aspen. RFTA may purchase around a fifth of the production of that to increase production at a maintenance facility. It would take a lot of land to provide solar energy for what the buses would need.

Q: We have heard about burning garbage to create energy from burned garbage. Is that related to the EVs you are discussing today?

A: Waste-to-Energy plants represent a small percentage of electricity generation in the United States. Additionally, regardless of where you are in the United States, operating an electric vehicle charged from the grid is cleaner than operating a conventionally fueled vehicle. Holy Cross has been looking
into composting and burning the methane to create the power. It lets food turn into methane gas. The methane generated from compost would also be a source of renewable hydrogen.

Q: Is the webinar being recorded for later viewing? Are the PowerPoints being posted/emailed for later viewing?

A: The webinar recording and PowerPoint have been posted on the National RTAP Webinars page. They were also emailed to all who registered for the webinar.