DEUSA Fleet Success Stories: Paris Special School District

Location: Paris, Tennessee
Fleet type: Class 7 All-electric School Buses

Narrative: Paris Special School District (PSSD) is a small, three-school district located in Paris, TN, which has a population of just over 10,000 citizens and is in Henry County, which is in the northwestern part of the state. The district's mission is to "educate the whole child by providing opportunities for excellence in a diverse community." East TN Clean Fuels (ETCF), and for our EV-centric efforts Drive Electric TN (DET), was first introduced to PSSD and its Director Dr. Norma Gerrell through member Central States Bus Sales (CSBS) and its General Manager Chuck Harvill.

In 2021, the Bipartisan Infrastructure Law (or "BIL") was released and included funding through the EPA titled the "Clean School Bus" (CSB) Program. While the first round of "Rebate" funding (versus the "Grant" funding rounds) was not officially released until spring 2022, ETCF's Chief Executive Officer Jonathan Overly spoke with Dr. Gerrell in 2021 to provide some of the basic information about electric vehicles (EVs), electric school buses, and charging them. DET already has a relationship with member Paris Board of Power Utilities (Paris BPU), and its Energy Solutions Manager Barry Flood, and all were connected to help Dr. Gerrell as she was very interested in pursuing the EPA Rebate funding. (The EPA released the Rebate funding as a lottery one of the aspects of it is that there is a modicum of paperwork required as compared to other grants, including the EPA CSB "Grant" funding which requires many pages of narrative and answering specific, targeted questions.)

CSBS, Paris BPU, and the "TN BEEP" collaborative provided assistance to PSSD, however CSBS actually submitted the proposal which included a request for funding to replace four diesel buses with Blue Bird "All American RE Electric" buses (CSBS is the sales affiliate for Blue Bird in Tennessee). The funding round closed in August 2022 and EPA announced the winners later that year. A map of all the winners in Tennessee and in some surrounding states is shown below, and PSSD – who won $1.58 million for those four electric buses – is highlighted with a blue circle.

The buses started arriving in fall 2023. It is expected that all of the buses will arrive in Paris, all check-ups and testing will be completed, and all of the buses will start on routes in early 2024. CSBS worked with InCharge as the EVSE provider and alongside Paris BPU, and the 25 kW DCFC units that PSSD will use were installed before the buses arrived. Harvill of CSBS says, "We couldn't be more excited to help implement these Type D electric buses for the students of Paris Special (School District) and Dr. Gerrell. Blue Bird has the most electric school buses in operation in the U.S. and we expect that their experience will be excellent, but we will ensure that is the case over the coming months."

One of PSSD's new Blue Bird electric "All American" (Type D) school buses arrives in Paris, TN in October 2023.

Outputs & Outcomes: The greatest result is the fact that an electric school bus has zero tailpipe emissions because the propulsion system has no tailpipe – *there are no longer ANY propulsion combustion emissions at the ground, passenger, driver, and urban community level.* All other combustion propulsion systems still have emissions that are released into the community, that directly impact human health. The U.S. needs to reduce diesel use as much as possible, as fast as possible. The use of diesel has profound impacts on both climate change and direct human well-being. As noted from the EPA, "(there is) staggering damage that diesel emissions from the transportation sector inflict on U.S. communities, charting the more than 8,800 deaths, 3,700 heart attacks, hundreds of thousands of respiratory illnesses, and approximately $100 billion in monetized health damages per year across the U.S." [1]

The outputs and outcomes are numerous and include:

- ✓ A quieter and smoother ride for the students and driver – no more loud diesel engine noise.
- ✓ That extends to the bus driver's ability to hear what is going on inside the bus, especially when compared to older diesel buses that had the engine at the front of the bus, drowning out the driver's ability to hear anything going on around him or her. This is an improvement in the safety of the kids that ride that bus.

[1] *2022, January. Clean Air Task Force website, "New CATF tool maps the staggering U.S. health and economic damages caused by diesel emissions", https://www.catf.us/2022/01/new-catf-tool-maps-staggering-health-economic-damages-caused-diesel-emissions/.*

- ✓ The district no longer needs to ride the wave of petroleum price volatility, which brings more stability to transportation management's fiscal planning. *(Prices have risen from $27.60 per barrel in 2000 to $161.23 in 2008 and back to $67.33 in 2018. [2])*
- ✓ Criteria pollutants are no longer emitted by the students' yellow transporter, so this brings health benefits to the students including reduced impacts from particulate matter (PM-2.5) and the gases that nitrogen dioxides (NOx) can form, such as ozone.
- ✓ That elimination of released criteria pollutants extends benefits into the local community as well. Since Paris is a smaller city and the district is a largely city district, this means (in this case) four diesel buses and all their health impacts have been removed from city roads.
- ✓ In Tennessee, the Tennessee Valley Authority provides power to almost the entire state. They have reduced the amount of coal used in electricity generation in Tennessee from nearly 60% in the early 2000's to roughly 20% in the early 2020's, and are now at an almost 60% greenhouse gas-free electricity production (GHG-free, thanks in large part to a nearly 40% nuclear base load). Using the current TVA grid generation mix, bus use data from PSSD, and Argonne National Laboratory's "Heavy Duty Vehicle Emissions Calculator," the NOx, PM-2.5, and GHG emissions reductions are all the largest when comparing electricity to new diesel and other alternative fuels for school buses. The below graph shows the results from that analysis (what is being shown are lifetime, life-cycle results from a comparison between all those alternatives to keeping the older diesel school bus on the road for another five years). A separate analysis using the AFLEET online tool yielded a 59% reduction in GHG emissions per year (12.3 to 5.0 tons/year) by switching one diesel bus to one electric bus.

[2] *2023, Smart Touch Energy website, "Why Do Oil Prices Rise and Fall?", https://www.smarttouchenergy.com/resources/why-do-oil-prices-rise-and-fall.*

Best Practices & Lessons Learned:
As these vehicles have just been received, our only recommendation is a best practice: get connected to the decisionmakers and communicate early and often, and ensure you cover all the different aspects of the grant funding and process, and of the vehicles and charging infrastructure. On the latter, and especially important when you have just a handful of buses like in PSSD's case, work with the local utility to decide whether you will use current services/meters or need new services and meters for the purpose of controlling demand costs related to electricity now being a "fuel" for buses.

Of course, the buses must be able to do the job – carry the riders from home to school and back, on the selected routes. As PSSD is just now starting their electric transportation journey, we don't want to take this for granted and will plan to update this story in the future once they have had enough time to have these buses on the road for a year or more and test their operations and reliability.