

# CALIFORNIA ELECTRIC SCHOOL BUS FAQ

ANSWERS TO FREQUENTLY ASKED QUESTIONS ABOUT  
AB 2731

By Advanced Energy Economy

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## **AB 2731 (Ting)**

### **California Electric School Bus FAQ**

AB 2731 would require all new school buses to be zero-emission by 2035. The bill also extends the lease term to 15 years to ensure long-term savings.

- **Is this target feasible?**
  - Prior to this bill, the state of California has committed to a 100% Zero-emission bus fleet by 2045. Some school districts are already well on their way to achieving this goal with some, like the Bay Area school districts, expecting to reach 50% electric within their school bus fleets by the end of 2022<sup>1</sup>.
- **Does AB 2731 assume, or recommend, that Prop 98 funds will be used for helping school districts meet this 2035 goal?**
  - This bill does not appropriate Prop 98 funds nor dictate which funding source(s) could be used to meet the state goal established by this bill. Rather, the bill builds on, and accelerates, progress being made through existing programs and funding streams already in place to defray costs and encourage the transition to electric school buses.
- **What programs are already in place to fund electric school buses?**
  - As of 2020, California invested roughly one hundred fifty million dollars (\$150,000,000) in school bus electrification, primarily through the Volkswagen settlement funds, California Energy Commission's School Bus Replacement Program, and the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) administered by the California Air Resources Board (CARB).
  - More than \$94 million is available through the School Bus Replacement Program for public school districts, county offices of education, and joint power authorities, most of which will support replacing old diesel school buses with pollution-free electric vehicles.
  - In addition, with the passage of the federal Infrastructure Investment and Jobs Act (IIJA), up to \$5 billion is allocated toward the purchase of zero-emission school buses through a competitive grant process through the Environmental Protection Agency. While the details of this program are still being written, such a program could provide funds to be dispersed in a way that fits with the priorities of the state. State funding dedicated to school bus electrification will make California school districts more competitive in applying for federal funding, setting up the state to vastly increase the resources available to electrify school buses.

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<sup>1</sup> School Transportation news - <https://stnonline.com/industry-releases/zum-rolls-out-first-electric-school-buses-in-californias-bay-area/>

- As part of California’s proposed budget for 2022-2023 school year, one-time funds would provide a \$1.5 billion grant program to help school districts purchase electric school buses and construct charging stations. Additionally, the California Department of Education’s Office of School Transportation stands to receive \$1.1 million to support the school bus driver training program.
- **Why are you advocating for extending lease terms for contracted electric school buses?**
  - Longer lease terms of 15 years could substantially improve the financial feasibility of electric school buses for school districts. In addition, shorter five-year leases do not align with the 12-15-year lifespan that research predicts is optimal for electric school buses to reach cost parity with diesel alternatives due to annual fuel and maintenance savings. Statutes in multiple states, including New York and California, currently limit leases to five years, which increases the cost of any lease for municipalities.
- **How much do electric school buses cost? What kind of long-term savings can school districts expect to see from transitioning to these vehicles?**
  - The upfront cost of an electric school bus is approximately \$350,000.
  - Electric buses provide significant savings for school districts over the lifetime of the bus. Districts can expect roughly \$5-10k per year in savings on fuel and maintenance costs over the lifetime of their bus, compared to diesel buses, depending on fuel and energy costs by region. School districts have reported a 60% reduction in maintenance costs and 80% reduction in electricity and fueling costs<sup>2</sup>. Over time these savings can help to offset the upfront capital expense.
  - Many school districts switching to electric school buses are taking advantage of federal and state grants, rebates and other incentives, as well as electric utility funding to further reduce purchasing costs.
  - Electric school buses may be eligible for Low Carbon Fuel Standard credits as another way to defray the upfront costs of these vehicles.
  - Vehicle-to-grid (“V2G”) programs, while only in pilot form now, have the potential to create additional revenue streams (or at minimum operational cost savings), thereby improving the value proposition and/or shortening the necessary loan terms for these buses.
- **Will electric school buses be able to cover the range and routes needed in hilly, rural areas?**
  - Manufacturers already offer an increasing variety of electric school bus models with ranges between 100 to 200 miles. These available ranges can currently serve 90% of

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<sup>2</sup> The Lion Electric - <https://thelionelectric.com/documents/en/BrochureLionCang.pdf>



school bus routes in the U.S.<sup>3,4</sup> with the average school bus route in the US being 63 miles a day<sup>5</sup>.

- Electric school buses run more efficiently than their diesel counterparts, in part because of regenerative braking. Regenerative braking simultaneously lowers the wear on braking systems and captures the kinetic energy to feed back into the battery, extending the range of the bus. Electric buses also have, on average, higher horsepower and torque levels which allow them to excel in hilly and mountainous environments. The average diesel bus has 200 – 350 HP and 500 – 1000 LB-FT of available torque while the average electric buses have 300-550 HP and 700 – 1,800 lb-ft of torque<sup>6,7,8</sup>
- **Can electric school buses operate in hot and cold weather?**
  - Many electric school buses are already succeeding in winter climates. School districts in Michigan, New York, Colorado, Illinois, North Dakota, and Ontario, Canada, have all reported no issues with the electric school buses' cold weather performance, operation, or charging. So, while electric school buses may experience a small reduction in battery range during extreme cold weather events (around 15% and up to 30% loss), there is even an electric bus operating in Tok, Alaska, that reports great operation even in 40 degrees below zero temperatures<sup>9</sup>.
  - Electric drivetrains offer more reliability in such environments as diesel and biofuels tend to jam engines in extreme cold.
  - Electric buses can draw from grid power while still plugged in for cabin heat and A/C before leaving the depot, reducing any potential impact from range loss.
  - School districts in hot climates also are adding electric school buses—such as Salt Lake City School District, where Transportation Fleet Manager Ken Martinez has said the goal is to run the new buses in all conditions. “These buses are equipped with air conditioning so we can run them all during the summer,” said Martinez to local news outlet KSL.<sup>13</sup>
- **How long does it take an electric school bus to charge?**
  - With a typical Level 2 (AC) charger, electric school buses can reach a full charge from empty in approximately 8 hours. With DC fast charging option, the charging time drops

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<sup>3</sup> World Resources Institute - <https://www.wri.org/insights/how-states-can-transition-electric-school-buses>

<sup>4</sup> GreenBiz - <https://www.greenbiz.com/article/5-ways-us-states-can-get-more-electric-school-buses-road>

<sup>5</sup> Thomas Built Buses - <https://thomasbuiltbuses.com/resources/articles/heres-what-you-should-know-about-electric-school-bus-range/>

<sup>6</sup> Lion Electric - <https://thelionelectric.com/documents/en/BrochureLionCang.pdf>

<sup>7</sup> The Lion Electric - <https://thelionelectric.com/documents/en/BrochureLionCang.pdf>

<sup>8</sup> School Transport News - <https://stnonline.com/partner-updates/torque-and-why-it-matters-for-school-buses/>

<sup>9</sup> Motor Biscuit - <https://www.motorbiscuit.com/alaska-using-electric-school-bus-cool-40-degrees/>



to approximately 3 hours<sup>10,11,12</sup>. Because buses will rarely be charging from zero, this charge time would be less for normal daily use.

- **What happens if the power goes out or there is a power outage?**
  - Backup power is usually a requirement, or best practice, at most depots already including traditional internal combustion engines, as gas or diesel pumps also do not work without electricity. Under a typical managed fleet scenario school buses could potentially offer a reliable source of backup power to a facility using the bidirectional charging capabilities (i.e., shifting power from the bus back to the facility/grid) currently installed on most models.
- **How long will these buses operate? Does the battery wear down over time?**
  - Electric school bus batteries are expected to have a 12 – 15 year lifespan<sup>13,14</sup>, with some experts extending that estimate to 20 years with excellent charging practices and use<sup>15</sup>. This timeframe matches a diesel school bus, which has an average lifespan of 12 – 15 years as well. Unlike a diesel school bus, electric school bus batteries can be repurposed as stationary storage, therefore creating an end-of-life resale value.
- **Are there mechanics who know how to service electric school buses?**
  - Many electric bus manufacturers provide initial training for bus drivers and mechanics as part of the purchase agreement and warranty of a new electric school bus. Many manufacturers also have online training instruction available to maintenance teams. Electric buses also have the benefit of having fewer parts and moving pieces than diesel buses (e.g., no oil changes, catalytic converters, etc.), so there are fewer parts that could need repair. Mark Alford, a heavy-duty mechanic with the Cajon Valley Union School District near San Diego described electric school maintenance as “Nothing really changes. Tires and breaks and general wear and tear, and all that other stuff is pretty much the same.” New business models like Fleets-as-a-service offer end-to-end operational services that include vehicle maintenance.

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<sup>10</sup> Thomas Built Buses - <https://thomasbuiltbuses.com/resources/articles/heres-what-you-should-know-about-electric-school-bus-range/>

<sup>11</sup> Commins - <https://www.cummins.com/news/2021/07/01/5-questions-about-electric-buses-answered>

<sup>12</sup> Blue Bird - <https://www.blue-bird.com/buses/electric-school-buses#:~:text=Blue%20Bird's%20electric%20buses%20can,charge%20in%20approximately%208%20hours.>

<sup>13</sup> Gregory Poole - <https://www.gregorypoole.com/electric-bus-guide/>

<sup>14</sup> Environmental Defense Fund - <http://blogs.edf.org/energyexchange/files/2021/02/ElectricSchoolBusFactSheet.pdf>

<sup>15</sup> Business and Technology Report - <https://www.cooperative.com/programs-services/bts/documents/reports/battery-energy-storage-overview-report-update-april-2019.pdf>

