



Flipping the Switch on Electric School Buses

Part 4: Charging Infrastructure

Key Information and Resources

Electric school buses are a growing topic of discussion in the transportation industry. The U.S. Department of Energy (DOE) is providing a [technical assistance program](#) aimed at K-12 schools that are interested in implementing electric school buses into their fleets. “Flipping the Switch on Electric School Buses” is a multi-part technical assistance series. Each part contains several modules that discuss key topic areas about electric school buses. Modules can be watched in order, or viewers can select just those that are most applicable to their information needs.

The fourth part in the series focuses on Charging Infrastructure. This part provides information about how to determine charging needs and how to select a charger, as well as charging infrastructure installation considerations to be aware of.

Modules in this part include:

- [Module 1: Determining Charging Needs and Selecting a Charger](#)
- [Module 2: Installation Considerations](#)

Key Resources and Highlights

Below is a list of the key tools and resources provided during *Part 4: Charging Infrastructure* of the “Flipping the Switch on Electric School Buses” series.

Module 1: Determining Charging Needs and Selecting a Charger

Presented by Jesse Bennett, National Renewable Energy Laboratory

- **Alternative Fuels Data Center (AFDC) Electricity Page:** afdc.energy.gov/fuels/electricity
 - This page provides information on electric vehicles (EVs) and charging infrastructure, including benefits and considerations, vehicle types, infrastructure development, procurement, and incentives.
- **AFDC Charging Infrastructure Procurement and Installation Page:** afdc.energy.gov/fuels/electricity_infrastructure_development
 - This page provides a charging infrastructure development checklist, as well as information on considerations such as cost, compliance, permitting, inspection, ownership, signage, and working with utilities and partners.
- **Charging Infrastructure Basics:** afdc.energy.gov/fuels/electricity_infrastructure
 - This is a resource with information about charging infrastructure terminology and different charging equipment and charging levels.
- **AFDC Vehicle Search Tool:** afdc.energy.gov/vehicles/search/

- Find and compare alternative fuel vehicles and download a list of results. Search by vehicle type (i.e., school bus) and engine and power sources (i.e., electric) to determine current electric school bus availability.
- **Report: Impacts of Increasing Electrification on State Fleet Operations and Charging Demand** <https://www.nrel.gov/docs/fy22osti/81595.pdf>
 - This report details an analysis performed on three fleets to identify vehicles for an EV replacement, and investigates the aggregate charging demand across a fleet at increasing levels of electrification.

Module 2: Installation Considerations

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- **Report: Electric Vehicle Supply Equipment Tiger Team Site Assessment Findings from Army Facilities** www.nrel.gov/docs/fy20osti/74538.pdf
 - This report examines how the U.S. Army can cost-effectively install electric vehicle supply equipment (EVSE) to prepare for anticipated EV acquisitions and summarizes results from 30 EVSE site visits completed at U.S. Army garrisons from 2016 to 2019. Sponsored by DOE and the U.S. Army, the National Renewable Energy Laboratory (NREL) deployed Tiger Teams consisting of engineers and fleet experts to review garrison charging needs and develop recommendations for installing EVSE as and, in certain locations, compressed natural gas stations.
- **Fleet Electrification Training Series:** www.youtube.com/playlist
 - NREL's fleet electrification experts developed training content and offered regional workshops to help fleets evaluate EV potential for sites, campuses, etc., including EV and EVSE basics.
- **EV Champion Training Series:** www.wbdg.org/continuing-education/femp-courses/fempodw062
 - EV Champion Training is a virtual training series hosted by NREL designed to provide fleet managers and coordinators with the skills and knowledge to become subject matter experts in EV implementation. This four-part training serves as an introduction to EV technology and considerations for EVSE installation. This course focuses on the basics of EV technology and financial considerations important for agencies considering fleet electrification.
- **Federal Fleet Electrification Checklist:** www.energy.gov/federal-fleet-electrification-checklist-fy22.pdf
 - This checklist lays out three distinct phases to transition a fleet to zero emission vehicles: plan, design, and execute. Within those phases, there are multiple goals and actions to take. This checklist serves as a general chronological guide, but actions may take place in a different order than described. Use this checklist as a guide to fleet electrification.