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Electric School and Transit Bus Pilot Program

Frequently Asked Questions

Who are eligible Project Partners?

Project Partners may include supervisory unions, school districts, schools, or any transit providers. For school entities utilizing transportation contractors, the school entity may apply on behalf of the school bus contractor(s).

How much do electric buses cost? Are Project Partners expected to pay any of these costs?

Electric school buses cost approximately $300,000 - $400,000. Electric transit buses cost approximately $650,000 - $1,000,000.

In the pilot program, the Volkswagen Environmental Mitigation Trust (EMT) funds will be used to pay for the incremental cost of the electric buses (i.e. the costs above the price of a new comparable conventional bus), the required charging equipment, and, for schools, the expected trade-in value for the school buses being replaced.

Project Partners are expected to provide a minimum funding match equal to the cost of a new conventional bus that is comparable to existing buses in their fleet.

What buses are eligible for replacement through the pilot program?

Diesel-powered, 2009 engine model year (EMY) or older, Class 4-8 school buses, shuttle buses, or transit buses that have been and continue to be registered, inspected, and in regular use in Vermont over the last calendar year prior to application submission are eligible.

How do we determine the engine model year (EMY) on a bus?

Typically, to determine the engine model year (EMY), you need to look at the label on the engine. The EMY will be on the label and the engine label will also state something like:

This 2006 model year engine has a primary intended service application as a medium heavy-duty diesel engine and conforms to US EPA and California heavy-duty regulations applicable for this 2006 Model Year…

You cannot determine EMY by decoding the VIN. If the engine label is missing, or if access to the vehicle engine is inconvenient, the EMY could be determined by contacting the vehicle or engine manufacturer directly. The manufacturer should be able to provide the EMY based on vehicle information including the VIN, engine serial number, etc.

Can we continue to use the diesel buses we replace?

No. Project Partners will be expected to deploy the electric buses in their regular transportation service, with a goal of maximizing eVMT (miles driven powered by electricity) and commit to fully scrapping each diesel-powered bus replaced as required by the VW trust.

What is the range of an electric school bus?

Most electric school buses have a starting range of 60 to 70 miles. Battery packs can be added to some models to increase range up to 150 miles.

Will the electric bus battery work in the winter?

When charging in the cold, the battery system will use an internal heater to keep itself warm and charge at a normal rate. Lithium ion batteries hold their charge well in the cold and are not damaged by freezing temperatures.

However, less energy can be pulled out of the battery when it is cold, meaning the bus range will be up to 30% shorter on the coldest winter days.

Strategies exist to minimize the effects of cold-weather on bus range including: plugging in before the afternoon route on very cold days; storing the bus in a garage on cold days so it starts out warm; onboard oil-fired heaters can help to maintain range on some vehicles.

What is the average charging time for an electric bus? How much will it cost?

Charging times will range from 4 to 8 hours, depending on usage and bus model. Fast charging (~2 hours) may be available for some models.

In Vermont, charging costs can be expected to range from $0.14 to $0.22 per mile when vehicles are plugged in at night or on weekends. This is compared to approximately $0.36 per mile for diesel fuel costs (at $2.50 per gallon). If a school bus travels 12,000 miles per year, fuel cost savings would be $1,700 to $2,600 per year as compared to diesel.

How will electric bus charging impact a school or transit agency's electric demand charge?

While every situation will be different, most schools and transit agencies will typically want to avoid charging buses between 6am and 10pm on weekdays, or they risk setting a higher peak demand.

Recharging buses mid-day could add about $3,000 per year in peak demand costs per school bus, or $10,000 per year per transit bus. VEIC will work with schools and transit agencies to develop and implement managed charging plans that minimize peak demand charges while accommodating operational needs.

If the battery is damaged in some way, will it be replaced?

Electronic and mechanical safeguards protect the battery, and premature battery failure will be covered by an extended warranty.

How much does it cost to replace an electric bus battery? When will that replacement be necessary?

The traction battery on an electric school bus could cost around $50,000 to replace, if replacement costs are not covered under warranty.

Battery capacity and bus range will decline over time. After 10 years, range may have declined by 30%. Batteries typically have a 12- to 15-year useful life.

What happens to the battery when the electric bus reaches the end of its life?

Used vehicle battery cells can be repurposed for stationary energy storage applications to help balance the power grid, or the battery cells can be broken down and recycled.

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Is the passenger capacity on electric school buses the same as comparable diesel buses?

Yes.

How will the timing of bus purchases align with school budgeting processes?

We anticipate placing orders for buses in March 2020, which we expect will align well with schools' bus replacement planning and budget approval processes. VEIC will help coordinate how funds are released from the Volkswagen Environmental Mitigation Trust (EMT) and how payments are made to vendors.

What are the emissions reductions associated with replacing an eligible diesel bus with an electric bus?

Emissions reductions of criteria air pollutants from replacing an old diesel bus with a new electric bus vary widely depending upon the model year of the bus replaced. Reductions in nitrogen oxides (NOx) for a school bus replacement range from around 93% to 99% and reductions of ultra fine particulate matter (PM2.5) range from roughly 16% to 98%. In terms of emissions of greenhouse gases, an electric school bus in Vermont will save about 325 metric tons of greenhouse gas emissions over its lifetime (97%) as compared to the diesel bus it is replacing. Annual greenhouse gas emissions savings by a single school bus are about 1.5 times an average American's personal emissions.

Over the life of a bus, energy cost savings can total as much as $36,000 (60%) for an electric bus as compared to diesel depending on demand charges and managed charging practices.