

TEN FACTS ABOUT BATTERY ELECTRIC BUSES

Electric Bus Costs Have Dropped over 40% in the last decade

A zero-emission bus uses electricity to charge an on-board battery pack, which powers its motor. The starting **cost of an electric bus is ~\$750,000**, comparable to a modern diesel-hybrid bus.

Electric buses are expected to reach capital price parity with fossil fuel buses by 2030¹ but they are already at parity if lifetime operation and maintenance costs are considered.

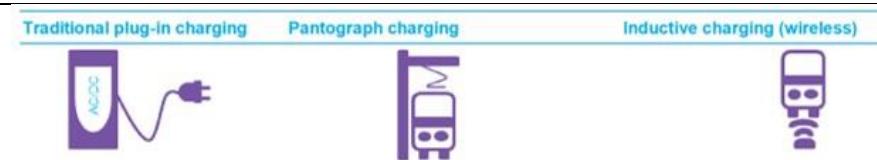


Expanding Bus Ranges and Declining Battery Prices Are Making Electric Buses Mainstream

Electric buses today can travel anywhere between **150 miles** on the lower end to **275 – 300 miles on a single charge**.

The price for lithium-ion battery packs has fallen 24% since 2016 and 79% since 2010², continuing to bring down upfront costs. By 2030 battery costs are expected to account for just 8% of the bus price.

Multiple Charging Options Allow for Overnight and On-Route Charging



Source: Bloomberg New Energy Finance

Charging options consist of (i) **Plug-in chargers** commonly used in depots (ii) On-route charging that includes **overhead chargers** and **wireless (inductive) chargers** that can be used to charge buses at bus stops and bus terminals or to top-up battery during layovers.

Electric Buses are More Fuel Efficient Than Their Fossil Fuel Counterparts

Electric buses are **four times more fuel efficient** than buses that run on diesel or compressed natural gas.

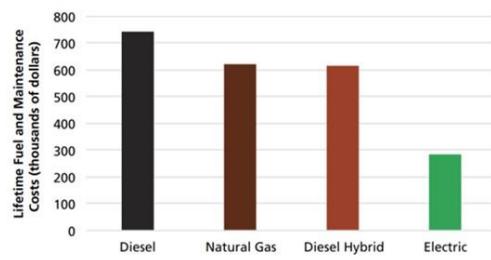


Source: U.S. PIRG

Electric Buses Have Lower Operation and Maintenance Costs

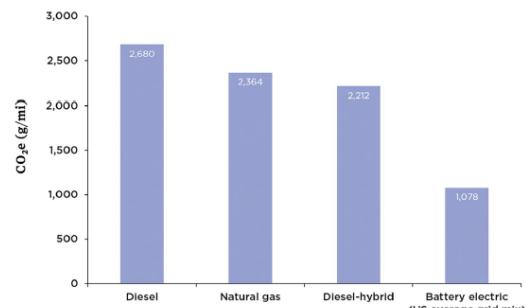
With fewer moving parts, electric buses are **hundreds of thousands of dollars less expensive to fuel and maintain** over their lifetime.

Source: U.S. PIRG



Electric Buses Are Better for Climate

When comparing the life cycle carbon emissions of all bus types, **electric buses are the cleanest** and will continue to get cleaner as our grid is powered by cleaner sources of electricity.



Source: Union of Concerned Scientists

Have No Tailpipe Emissions and Offer Air Quality Benefits

Unlike electric buses, vehicles that run on fossil fuels release high levels of particulate matter and toxins that increase the risk of respiratory and cardiovascular disease. Residents of color in MA are exposed to vehicle pollution that are **26 to 36% higher** than the exposure to white residents³.

Transit Agencies Across the Nation Are Adding Electric Buses to their Fleet

There are **1500+** **electric buses** on order or deployed at over **130 transit agencies** across the country⁴, including in cold weather cities like Denver, Chicago, and Philadelphia.



Source: CALSTART

Several funding and financing options Are Making it Easier to Purchase or Lease Electric Buses

Transit agencies can make use of Volkswagen Settlement funds, and competitive funding through the Low or No Emission Vehicle Program and Congestion Mitigation and Air Quality (CMAQ) Improvement Program to support their transition efforts. Manufacturers now offer bus and battery leasing programs and there are utility infrastructure programs that reduce upfront costs for transit agencies.

Initial Challenges to Adoption is Spurring Innovation

Key challenges to adoption include (i) Higher upfront costs, (ii) concerns about the distance a bus can travel on a single charge especially on longer routes, and (iii) decrease in battery efficiency in extreme cold or heat. These challenges are solvable and there are solutions available today that can be adopted in the short term as the technology continues to advance.

Endnotes

¹ <https://www.sierraclub.org/articles/2019/02/for-us-transit-agencies-future-for-buses-electric>

² <https://data.bloomberglp.com/professional/sites/24/2018/05/Electric-Buses-in-Cities-Report-BNEF-C40-Citi.pdf>

³ <https://www.ucsusa.org/sites/default/files/attach/2019/06/Inequitable-Exposure-to-Vehicle-Pollution-MA.pdf>

⁴ <https://calstart.org/wp-content/uploads/2018/11/Breathing-Easy-August-2018.pdf>