



ElecTruck™ System Powers the Largest Road Vehicles with Clean Battery Energy

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Fact Sheet

The Issue

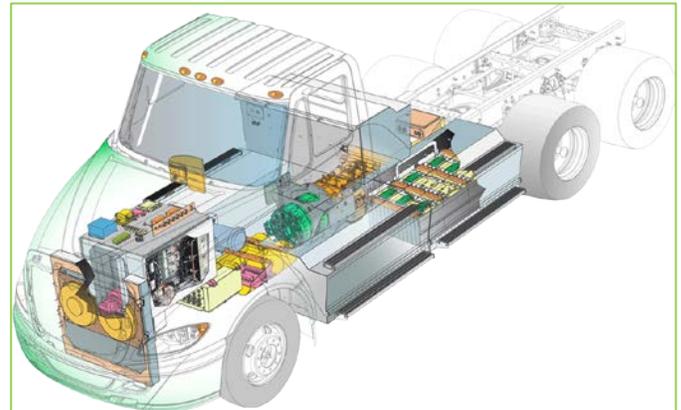
Large road vehicles such as Class 8 trucks make up only a small fraction of the U.S. vehicle population, but consume disproportionately high amounts of fuels while producing significant amounts of toxic pollutants and greenhouse gases. Operating these vehicles on battery-electric power eliminates fuel use and tailpipe emissions entirely. However, past efforts to run large road vehicles on battery power have encountered numerous obstacles, including:

- Weight of battery packs.
- Battery costs and limited longevity.
- Reduced operating range.
- High vehicle capital costs.

In addition, many trucks and other large vehicles equipped with battery-electric propulsion systems have exhibited insufficient power and/or reliability to meet vehicle operator needs.

Project Description

The goal of the ElecTruck™ Drayage Demonstration (EDD) initiative is to develop a more practical, affordable battery-electric propulsion system for Class 8 trucks weighing up to 80,000 lb. Development of core ElecTruck™ technologies was initiated by TransPower in 2011, with funding support from the California Energy Commission (CEC), South Coast Air Quality Management District (SCAQMD), and U.S. Environmental Protection Agency (EPA). The first vehicle to utilize these technologies was a battery-electric "Pilot Truck," that was tested at the Ports of Long Beach and Los Angeles throughout 2014.



Integrated design layout of TransPower's battery-electric drive system. Source: TransPower.

Based on the results of nearly a year of testing of the Pilot Truck, TransPower made several enhancements to the ElecTruck™ design. The updated version of the ElecTruck™ system features improvements in the producibility and serviceability of the battery energy storage subsystem and integrated Power Control and Accessory Subsystem. This advanced drive system is being installed into seven Navistar International trucks, and implements flexible integration and control methods that can be cost-effectively applied to many vehicle models. The first two of the initial seven electric trucks are completed and in drayage service at the Long Beach and Los Angeles ports, and the remaining five will be entered into service in early 2015. The battery-electric drive system integrated into these trucks has the following features:

- Large format lithium-ion batteries offering high energy density, large safety margins, and lower

costs than competing advanced battery chemistries.

- Advanced battery management systems to help maximize battery life and minimize system maintenance costs.
- Unique Inverter-Charger Unit (ICU), which combines inverter and battery charging functions and uses proprietary technologies to reduce the size and cost of power electronics.
- Automated manual transmission using proprietary software, which provides high vehicle performance under varying road conditions while improving drivetrain efficiency.
- Flexible EVControl™ control system that can facilitate adaptation of the ElecTruck™ system to multiple vehicle models.

In addition to the above features, vehicles using the ElecTruck™ system use advanced electrically-driven accessories for power steering, braking, and air conditioning, replacing the inefficient engine-driven power take-off units used in conventional vehicles.

Anticipated Benefits

Use of the zero-emission ElecTruck™ system will help preserve the environment and enhance America's position as a leading force for reducing greenhouse gases and global warming. This will have a particularly beneficial effect in communities adjacent to seaports, where large numbers of highly-polluting diesel trucks are congregated in very small areas. Widespread use of battery-electric propulsion will also help reduce the nation's dependence on fossil fuels. The ElecTruck™ project benefits the economy by creating high-skill jobs in such areas as:

- ICU and battery pack assembly.
- Electric vehicle integration.
- Servicing of battery-electric vehicles.

The benefits of the project will be felt beyond the trucking industry because the components used in the ElecTruck™ system can be used in transit buses, school buses, and many other types of vehicles. Key ElecTruck™ components can also be used in stationary energy storage systems.



Project Specifics

Contractor: Transportation Power, Inc. doing business as TransPower

Funding Committed to Date:

\$3,296,167 from CEC

\$1,142,070 from DOE (administered by SCAQMD)

\$871,500 from SCAQMD and EPA

\$300,000 from Ports of Long Beach/Los Angeles

\$1,816,624 from TransPower/industry partners

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