FTA RESEARCH
FEDERAL TRANSIT ADMINISTRATION

REPORT SUMMARY

U.S. Department of Transportation
Federal Transit Administration

National Fuel Cell Bus Program: Proterra Fuel Cell Hybrid Bus Report, Columbia Demonstration

Background

This is an interim report for an ongoing project. The report summarizes the experience and early results from an electric fuel cell bus demonstration funded by the Federal Transit Administration (FTA) under the National Fuel Cell Bus Program. A team led by the Center for Transportation and the Environment and Proterra designed and developed an entirely new hybrid electric fuel cell bus. The National Renewable Energy Laboratory was tasked by FTA to evaluate the bus in service. This report documents the early development and implementation of the bus and includes a summary of the performance results at the first demonstration site—Columbia, South Carolina.

Objectives

The objective of the overall research effort is to develop and demonstrate a battery dominant fuel cell bus, and to move the industry closer to commercialization of electric fuel cell buses. The objective of the report is to disseminate information about the independent evaluation conducted by NREL of the subject vehicle.

Findings and Conclusions

During the six-month demonstration period in Columbia, SC, the bus accumulated 2,947 miles and used 399.7 kg of hydrogen for an average fuel economy of 7.37 miles/kg, which equates to 8.33 miles per diesel gallon equivalent (DGE). As a result of the research conducted so far, a number of fuel cell bus components were identified for replacement or upgrade to ensure that the vehicle will meet performance objectives for the next phase of the demonstration. These components include the transmission, DC-DC converter, and battery management system. Once the modifications are complete, the vehicle will be shipped to Austin, Texas, for a one-year demonstration.

Benefits

This project has helped to introduce a new bus manufacturer, and new electric bus design, to the US market. The lessons learned from this project have been incorporated into Proterra electric buses being procured in several cities across the country. Moreover, by documenting the early development, implementation, and performance of Proterra's newly developed hybrid electric fuel cell bus, the research results contribute to the larger endeavor of facilitating the development of electric drive bus technology.

Project Information

FTA Report No. 0003

This research project is led by the Center for Transportation and the Environment. The report was written and the evaluation conducted by the National Renewable Energy Lab. For more information, contact Sean Ricketson, FTA Research Manager, at 202-366-6678, sean.ricketson@dot.gov. All research reports can be found at **www.fta.dot.gov/research**