Abstract
The National Renewable Energy Laboratory (NREL) conducts evaluations of fuel cell transit buses for the U.S. Department of Energy and the Department of Transportation’s Federal Transit Administration. NREL works with transit agencies, manufacturers, fuel providers, and the industry to validate hydrogen and fuel cell vehicles in heavy-duty applications. The data collected and analyzed are used to verify performance targets and assess technology readiness. Using an established protocol, NREL provides comprehensive, unbiased results on the performance, operation, and costs of the buses in comparison to those of conventional-technology buses used in the same type of services. Transit fleets demonstrating this technology have shown fuel economy improvements of nearly two times that of conventional buses.

NREL’s current evaluations include three transit agencies demonstrating a total of five prototype fuel cell buses including AC Transit in Oakland, California; SunLine Transit Agency in Thousand Palms, California; and CTTRANSIT in Hartford, Connecticut. These agencies are currently operating hybrid fuel cell buses developed by UTC Power, ISE Corporation, and Van Hool. Demonstration programs, such as these, are essential to validate the performance of the current generation of fuel cell systems. Early prototype FCBs have demonstrated improved performance characteristics—faster acceleration, lower noise, and no tailpipe emissions—over conventional buses in transit applications. Although progress has been made, more work is needed to improve reliability and durability of fuel cell systems to meet the needs of transit agencies. The early results reported to date provide insight into the status of FCB technology and help determine issues that require further development.

Through the end of June, 2008, these five fuel cell buses had accumulated more than 155,000 miles in service with a fuel economy ranging between five and eight miles per kilogram. The most recent progress and accomplishments of the demonstrations will be presented. Specific data results will be presented on fuel economy, mileage accumulation, availability, reliability, and operational costs. A summary of the experiences with fuel cell buses and hydrogen infrastructure, lessons learned, and the industry’s needs for continued successful implementation of this advanced technology will also be included.