

**Success Story:**  
Kentucky Department of Education

**Market Served**  
Public Education



## Kentucky Hybrid School Buses Head Nation's Class

**Location:**

State of Kentucky

**Segment:**

School Bus

**Challenge:**

Heavy stop and go duty cycle reduces fuel economy and brake life.

**Solution:**

Eaton Hybrid Electric Power Systems

**Results:**

Lower operating costs resulting from decreased fuel consumption and improved brake life. System is quiet and improves air quality.

**Contact Information:**

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*"We have seen some huge gains in fuel efficiency. When we compared the fuel consumption to a bus that we were using the previous year with the same specifications, the MPG went from 6.3 to almost 10 and even 11 depending on the driver and where the vehicle was being driven."*

*Ancie Casey, transportation director for the Pike County School District*

**Background**

Already very much proud, and deservedly so, of its bourbon, thoroughbred racing, college basketball and the Colonel's original recipe, the state of Kentucky now has bragging rights to yet another noteworthy achievement – the largest number of hybrid electric school buses in the nation.

More than 125 through August 2011, in fact, and the numbers are climbing.

A host of individuals, associations, departments and governmental agencies have all had a role in bringing about the success of the hybrid bus program in Kentucky, including the U.S. Department of Energy, the Kentucky Department of Education, the Kentucky Clean Fuels Coalition (KCFC), as well as administrators, transportation directors, bus drivers and maintenance professionals located in school districts throughout the state.

"Teamwork has been key to our success," says Melissa Howell, executive director for KCFC.

The environmentally friendly vehicles are now operating in 33 different school districts, where the buses have accumulated more than 500,000 miles of road service.

**Challenges**

A good portion of the funding for all of those vehicles, notes Howell, is provided by the U.S. Department of Energy, with the department picking up the tab for the difference in cost between a hybrid-powered bus and a non-hybrid-powered bus.

As a responsible governmental agency, the Department of Energy just does not simply dole out money for that many buses without accountability.

Howell says it's that same teamwork with all of the many people involved with the school bus purchasing process that's delivering the answers. Providing those answers requires an extensive collection of data regarding the fuel consumption and performance of every one of those vehicles.



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## Solution

For help she and the others turned to Eaton Corporation, which supplies and supports the hybrid electric systems on all of the fuel-saving Thomas Built and International school buses.

"Eaton has been an outstanding supporter and we have been so fortunate to be affiliated with the company," says Howell. "Hardly a day goes by that I am not speaking with someone who works for Eaton. Having that kind of relationship is a nice place to be, especially in this day and age when voice mail and emails have practically replaced direct communications."

George Johnson, who has been with the Breathitt County School District in eastern Kentucky for 30-plus years as a bus driver, mechanic and driver training instructor, says, "The folks at Eaton have been doing a very good job, and they seem to be really interested in trying to save fuel and protecting the environment."

Sam Sanders, superintendent for the Larue County School District in central Kentucky, adds that his transportation director and maintenance supervisor have been equally satisfied with Eaton's support.

## Results

That transportation director, Phil Fulkerson, says the four hybrid buses in Larue County's fleet are averaging about 9.59 miles per gallon. "We were getting about 6.3 miles per gallon with similarly equipped non-hybrid buses," he says. "So that's an impressive 30 percent improvement."

Ancie Casey, transportation director for the Pike County School District in the eastern most region of Kentucky, has also been impressed.

"We have seen some huge gains in fuel efficiency," says Casey. "When we compared the fuel consumption to a bus that we were using the previous year with the same specifications, the MPG went from 6.3 to more than 11 depending on the driver and where the vehicle was being driven."

His bus driver trainer with more than 33 years of experience, Kenneth O'Quinn, says Pike County, with a total area of roughly 789 square miles, is geographically one of the largest counties in the country. His school bus fleet services some 24 schools and averages about 14,000 miles of road service per day.

The pair of school transportation veterans figures a county that big deserves an equally big investment in hybrids.

"We are currently running 37 hybrid buses, which is the largest school bus fleet in the nation," boasts Casey. "We wanted to take the lead in this project and we have. We don't like to follow."

He adds that his drivers especially like the quiet operation of the hybrid units, with one older driver telling him recently "this is the Cadillac of buses."

Back in Breathitt County – with one high school, one middle school and three elementary schools – Johnson says his eight hybrid buses are generating fuel consumption gains from 3.5 – 4.5 miles per gallon when compared to conventional buses.

With some of his hybrid buses now closing in on 12 months of service, Johnson has also noticed significant improvements in brake wear.



Sam Sanders, Superintendent, LaRue County Schools

"One of the buses operates on hilly terrain and the brakes usually wear faster than on the other buses," he says. "Well when we inspected the brakes you could hardly even tell that the brakes were being used. I guess the regenerative braking is doing what it's supposed to do."

Larue County's Fulkerson agrees. "We put one of our first hybrid units, which was actually the first hybrid school bus in Kentucky, on a real brake-padeating route. There are some big hills, and typically in a year we have to put new brakes on it. But with this charging set-up that Eaton has, it is saving all kinds of brake wear. That bus now has about 15,000 miles on it, and the brakes are not any where near needing to be changed."

Transportation officials at all three of the school districts say they are looking forward, with more funding currently available, to additional hybrid purchases in the future.

Summarizing the success of Kentucky's hybrid bus project so far, KCFC's Howell, says, "What I know from the data that we have gathered so far, is that the Eaton hybrid buses should be capable of doubling the MPG figures of conventional buses. I know because we have districts that are nearly 12 miles per gallon.

"So Eaton is definitely delivering on what they told us the systems would be capable of doing."

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