

AUTOMOBILES

# As Hybrid Buses Get Cheaper, Cities Fill Their Fleets

By MICHELINE MAYNARD OCT. 20, 2009

IF you wonder whether hybrid-electric vehicles will ever catch on, simply ask one of the millions of people who ride in them every day.

Hybrid-electric buses, that is.

Transit systems from New York to Taipei, and from Ames, Iowa, to Ann Arbor, Mich., are adding hybrid buses at a rapid clip. New York, by far, has the nation's biggest fleet of hybrid buses, which run on electricity and diesel fuel, with nearly 1,000 in all five boroughs, most in Manhattan.

Although the initial cost is well above that of a conventional diesel-powered bus, hybrid buses emit less pollution and get far better fuel economy. They are quieter than old-style buses, and their ride is generally more comfortable (not accounting for the condition of city streets). Like the hybrid taxis that have become a common sight in New York, hybrid buses arrived during the last decade.

Transit officials faced pressure in the mid-1990s to clean up their bus fleet, which was a major contributor to air pollution on city streets. "We were looking at what to do to reduce bus emissions as quickly as possible that didn't have a major cost," said Joseph J. Smith, senior vice president for the department of buses for the MTA New York Transit Authority.

Its first option was not hybrids, however, but buses that ran on compressed natural gas, or C.N.G.

While those buses are starting to become more popular across the country, the costs back then to switch from an all-diesel to a C.N.G. fleet would have been prohibitive, Mr. Smith said. “It was unbelievable the kind of money you would have had to invest in those garages,” he said.

In 1998, the transit authority began using its first 10 hybrid-electric buses, costing \$1 million each; they became guinea pigs for what turned out to be a successful experiment. By 2001, the city had ordered another 125 and subsequently bought hundreds more.

Today, New York has the largest fleet of hybrid buses of any city in the country — 850, out of a fleet of 4,500. And the price has dropped by half, although hybrid buses are still twice as expensive as conventional diesel buses.

Environmentalists argue that the switch has been worth it, in terms of public health. “People say that it’s expensive to switch from diesel to hybrids or natural gas. The question is, how much are your kids’ lungs worth?” said Daniel Becker, director of the safe climate campaign of the Center for Auto Safety in Washington. The improvement in pollutants has been impressive. From 1995 to 2006, diesel particulate emissions — also known as soot — dropped 97 percent, while emissions of nitrogen oxides dropped 58 percent per bus.

The buses’ performance has been impressive, especially by bus standards. Each is expected to save the city 50,000 gallons of diesel fuel, compared with what would be consumed by a conventional bus, or a 45 percent improvement in fuel economy.

The typical hybrid bus gets 4 miles per gallon, which pales when compared with the 50 m.p.g. of the Toyota Prius, but a city bus weighs 20 tons, compared with a 3,000-pound car. The average all-diesel bus gets about 2.75 m.p.g., Mr. Smith said.

Much of the fuel economy savings can be traced to new lithium-ion batteries, like those on a camera or cellphone, which have been installed in the buses.

Their early batteries, which were lead acid, cost \$20,000 and needed to be replaced every two to four years. The lithium batteries are expected to last six

years, and the weight difference alone equals a 13 percent improvement in fuel economy. But those batteries are expensive, at \$60,000 each.

The batteries mean that overall maintenance for New York's hybrid buses is more costly than for conventional diesel buses. However, the hybrid buses are easier to fix — and most important, don't break down as often, which the department measures as “mean distance to failure.”

The newest buses to make their appearance in the city are a pair of turbine-driven hybrids, the first of eight that will join the fleet. (Baltimore is also testing turbine-driven buses.)

“It will revolutionize the way we do business in the garages,” Mr. Smith said. “There is no oil, there's no transmission, there's no starter, there's no generator, no antifreeze for a radiator. When you have an inspection every 3,000 miles, you do not have to drain the oil or drain the transmission.”

Moreover, the bus will not need a filter to catch particulates, small bits of filth from diesel fuel. The filter normally requires changing every year.

Along with changing life at depots, the buses have changed life for drivers and for repair crews. After all, New York has operated diesel-powered buses since 1938, said Henry Sullivan, the department's chief maintenance officer.

Each driver receives roughly an hour of training to become familiar with the functions of the bus and then is coached in the correct way to drive it.

Mechanics, meanwhile, undergo significant training, Mr. Smith said, because the batteries can pose a hazard. “You're not dealing with 12 volts or 24 volts, you're dealing with 600 volts,” he said. “You make a mistake — that could kill you.”

Beyond hybrids, officials are looking to the next phase of alternative-fuel buses, which will be equipped with hydrogen-fuel cells. The first one will be tested by the city next spring, but Mr. Smith said he did not expect them to be commercially available for at least 15 years.

Still, if New York's experience with hybrid buses is any indication, other communities could follow the city on its path to cleaner transportation.

“You pay through the nose in the beginning, but we opened the door for these smaller cities to have hybrids”, Mr. Smith said. “We see it as building bridges from one technology to another technology.”

Meanwhile, the public interest in hybrids of all types, cars and buses, also helps, Mr. Becker said. “It’s sort of a rolling ad that you can live a comfortable lifestyle without destroying the planet at the same time.”

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