
Driving ZENN

The diminutive Zenn is silent and has no emissions. But will small electric cars with limited speed and range catch on?

by **HANNAH ELLIOTT, ForbesAutos.com**

It might sound surprising, but all-electric vehicles are already on American roads. They just haven't quite made it to the highway yet.

A growing cottage industry of Neighborhood Electric Vehicle manufacturers is spurring the development of cars like the Zenn, which has reached a state of vehicular enlightenment so advanced it doesn't even need a tail pipe.

"We saw this car in May of '06, and all of us were just freaking out: 'Finally, a car!'" said Steve Mayeda, sales manager at Seattle-based MC Electric Vehicles, which sells 30 percent of Zenn's U.S. inventory, in addition to electric vehicles made by Columbia, Canadian EV, E-Ride and Miles. "Zenn was the first neighborhood electric car that actually looked and felt and drove like a real car. Everything else before that was either a converted golf cart or a car that was built from the ground up."

Mayeda was referring to vehicles like the 36,000 ovoid GEM cars that Chrysler-owned General Electric Motocars has sold worldwide over the last decade. To be fair, the GEM, like most NEVs, is actually more than just a glorified golf cart.

Around the Neighborhood

NEVs are silent, have no tailpipe emissions (or tailpipes, for that matter) and plug into electrical outlets like vacuum cleaners. They come in two varieties: Low-Speed Electric Vehicles, which have a top speed of about 25 miles per hour and are restricted to roads where the speed limit is 35 miles per hour or less; and Medium-Speed Electric Vehicles, which reach 35 mph and are allowed on roads with a posted speed of up to 45 mph.

They're exempt from federal safety regulations that mandate impact-absorbing bumpers and airbags. But to be street legal, NEVs must have three-point seat belts, windshields with wipers, headlights, brake lights, rearview mirrors and turn signals. Doors are optional.

The Zenn is among a new generation of NEVs that look like real cars. But a spin around Manhattan in one proves it has some growing to do before it can truly compete with automobiles.

Cute as a Button

The 1,350-pound Zenn, which stands for "Zero Emissions, No Noise," offers a beguiling first impression for those inclined to fawn over bunnies and kittens. But don't let that button-cute persona fool you.

"It's a tough little car," said Ian Clifford, founder and CEO of Zenn Motor Co., based in Toronto, Canada.

He pointed to the fact that in France, the aluminum-frame Zenn has passed all government-mandated safety standards for the quadracycle class of vehicles, which are like NEVs and have a top speed of 30 mph.

Onlookers seemed to like the Zenn, although its matte tones and boxy styling didn't get as many looks as expected. One older gentleman from Switzerland, in high spirits on a nature hike in Central Park, said America would do well to get more Zenn-like vehicles on the road.

Taxi drivers loved the Zenn, too. At traffic lights they shouted questions and comments like, "Hey! What is that? What's the mileage?" and "That's cool, man!" Every one of them said having a 25-mph car in New York City would be "no problem, man."

It seemed like the Zenn was living up to its name. "They're traffic calming," Clifford said, referring to their lack of speed. "And if they do get into a collision, the impact is much less severe." NEVs' slow speeds are also safer for pedestrians, he added.

Dollars and Sense

The two-seat Zenn starts at \$15,995. The model we drove had options that drove up the price.

Zenns get the equivalent of 254 miles per gallon, Clifford said. It costs less than two cents per mile to drive, based on the average retail rate of electricity in the United States of 10.15 cents per kilowatt-hour. Regular cars cost about 10 cents a mile to drive, according to a 2006 report from the Energy Information Administration.

"We've had no complaints. Everyone loves their car," said MC Electric Vehicles' Mayeda, who co-wrote Washington's House Bill 1820, which allows electric cars to legally attain speeds of up to 35 mph. If Clifford can get his Zenn cars to go a little faster, Mayeda said they'll sell like hotcakes.

"We would be able to sell as many of these cars as they're selling Hondas and Toyotas," Mayeda said. "Even if they made it a \$30,000 car, easily we could have Toyota numbers. There's enough people out there who are tired of paying high prices for gas, who don't like buying and supporting foreign oil."

One of the biggest hurdles for NEVs, and all electric vehicles for that matter, is their range on a single charge. With its lead-acid batteries — just like those used in normal cars — the Zenn can only go 35 miles on a single charge and takes eight hours to fully recharge. The batteries will fill to 80 percent in four hours.

NEV manufacturers like Zenn Motor Co., British Columbia-based Dynasty Electric Car Corp. and Norwegian-led Think Global argue that most Americans can get by just fine driving a small amount of miles each day at relatively low speeds.

While that remains to be seen, the Federal Highway Administration reports that on average, the longest trips American drivers make each day range in length from 16 miles to visit family or friends to 11 miles for medical purposes. The average American drives 12 miles to work, according to the FHA.

The Urban Transport Fact Book reports that the average "road network speed" in large American cities ranges from 24 mph in New York to 39 mph in Sacramento — speeds easily accessible by existing electric cars.

Beyond the Neighborhood

In fall of 2009, Clifford plans to start selling the City Zenn, which will go up to 80 mph and have a range of 250 miles on a single charge. It will launch in Europe first, then Asia and South America. Clifford

declined to say when it would be offered in the United States, but he did say it will cost somewhere "in the low 20s."

The next-generation batteries that will power the new Zenn vehicle don't even exist yet. They're being developed by EESor, an Austin, Texas-based technology firm in which Zenn Motors invested \$2.5 million in May 2007. The proposed 300-pound 52 kilowatt-hour ceramic battery would charge in roughly five minutes, use no hazardous materials and be virtually unaffected by temperature, EESor reps said. It would be able to power a mid-size car for more than 200 miles at highway speeds, according to a press report from Zenn.

So far, electric vehicles' success has been thwarted because the technology did not exist to make batteries large and light enough for long-distance operation. But EESor executives are confident their new technology will redefine automotive battery use as we know it.

"With any startup, you have some minor speed bumps and/or market opportunities that come up from time to time," said Tom Weir, vice president and general manager of EESor. "But we see no show-stoppers at this point."

Mayeda says if they can build it, customers will buy it.

"People are coming into our store who have never driven an electric car before, but who are interested in getting one of their own," Mayeda said. "You can just imagine what would happen if I said, 'Here, I've got this 80-mph electric car right here.' Even if EESor is late, it's going to be great."

Electrifying the Masses

Not everyone is bullish about NEVs. Only about 2 percent of American drivers are willing to seriously consider an electric vehicle, said Art Spinella, president of CNW Marketing Research in Bandon, Ore. That's slightly higher than the numbers in 2000, when 1.3 percent of the population expressed an interest in electric vehicles.

The technology hasn't been welcomed everywhere, either. Connecticut, Delaware, Nebraska, Pennsylvania and Wyoming have banned electric vehicles on public roads.

Then there is the issue of where to get the all the electricity to power the vehicles. As it stands right now, the existing power grid in the United States could fuel 180 million electric cars, according to a 2006 Department of Energy study.

Research by the Oak Ridge National Laboratory found that by 2030, if a large percentage of Americans are driving hybrids or electric vehicles and charged them at 5 p.m. at 6 kilowatts of power, then up to 160 new power plants nationwide would be needed to supply the extra electricity.

But the ORNL study also found that if the same number of vehicles were plugged in after 10 p.m., when the toll on the power grid is lowest, charging at low-demand levels would require no additional power plants, and, at high-demand levels, would require only eight additional power plants nationwide.

And a 2007 study by the Electric Power Research Institute and the Natural Resources Defense Council found that if 60 percent of cars sold in the United States were plug-in hybrids, no more than 8 percent of the electricity available would be used.

The bottom line? With their emission-less technology but impracticality as primary transportation, NEVs present a potentially alluring — but currently unconvincing — choice for many eco-aware drivers.

Spinella, for one, has taken a wait-and-see approach: "It is a viable source of transportation, but the interest is not going to grow unless the issues are addressed."