



Electric cars were once thought to be an inevitable solution to America's energy problem, thanks to Uncle Sam. So what happened?

WHERE ARE ALL THE ELECTRICS?

By Richard Wolkomir

DO YOU DRIVE an electric car? Do you expect to buy an electric car in the next few years? Have you ever even *seen* an electric car?

If your answer to any two of those questions is no, you qualify as a member of the Puzzled Majority. The majority, because few Americans own—or expect to own—electric cars. And puzzled, because just a few years ago, the electric car was something of a media lion, touted in print and on the tube as America's answer to OPEC. Rumor even had it that General Motors would be mass-producing electric vehicles by 1983.

Well? Where are the electric cars?

Behind all the hoopla was Public Law 94-413, passed by Congress in 1976. Its aim was simple: to ease America's appetite for foreign oil by replacing a percentage of our gas-gulping cars and trucks with electrics. Senator James McClure (R-Idaho), a chief backer of "The Electric and Hybrid Vehicle Research, Development, and Demonstration Act," first tooled around Washington for six months in a leased electric van to prove to himself that he would not be squandering taxpayer money on a Rube Goldberg contraption.

The sum in question was sizable—over \$160 million. But Senator McClure was convinced. "We can get the speed and range we need for millions of commuters with the batteries we have today," he told reporters.

By 1978, the Department of Energy had its Electric and Hybrid Vehicle program juiced up and for three years after the program, pumped money into research, development of a market for electrics and a demonstration project that was to have 10,000 electric vehicles on U.S. highways by 1986.

It was the demonstration phase that attracted the most attention. But don't run to your window, looking for a live specimen on the nearest street. Those 10,000 demonstration vehicles never will materialize.

"We're now leaving that phase of the effort up to private enterprise," says Paul J. Brown, director of the Electric and Hybrid Vehicle Program.

So far about 1,400 demonstration vehicles have hit the highways. American Telephone and Telegraph is operating a fleet. So are utilities such as Consolidated Edison in New York, Arizona Light and Power and Long Island's LILCO. Other fleets are operated by everyone from municipal governments (such as in Albany, N.Y., in Denver, Colo., and in Kansas City, Mo.) to the University of Hawaii.

But 1,400 cars is a long way from 10,000. The problem? No money in the kitty. Carter-administration budget cuts wounded the program. And Reagan-administration cuts have put it out of its misery.

The demonstration cars are mainly run by corporations and municipalities, who put up 52 percent of the money required, with DOE

funding the other 48 percent. "It has been running for three years, but now we have no funds to add to the fleet," says Paul Brown.

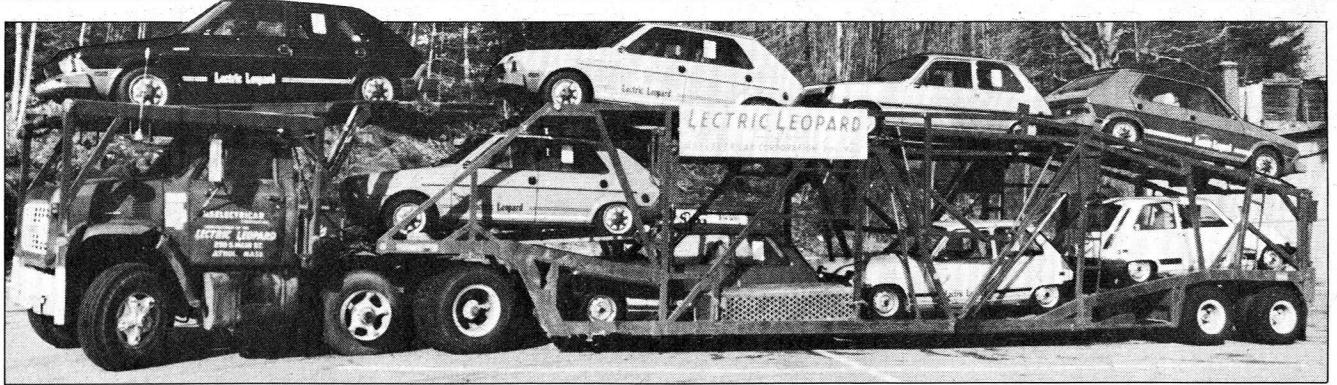
Some believe it was the wrong fleet to begin with. "The original thinking was to put 10,000 passenger cars on the road," says Warren C. Harhay, president of Electric Vehicle Associates, Inc. "We went to Washington and said, 'No, no, no, you can't do that with the present state of the technology, it has to be commercial vehicles and it has to include buses,' and they said that buses use only 2 or 3 percent of the oil, and that's another department's problem anyway. . . ."

Harhay believes that today's electric cars make sense only for fleet operations—company cars and vans, taxis, buses, delivery trucks. One reason is that ordinary drivers would have no place to go for service. Another is that the electric vehicle's pip-squeak range makes it viable only for relatively short, fixed routes.

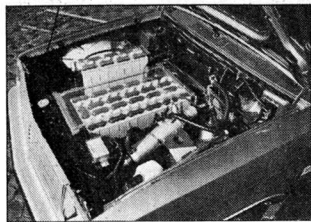
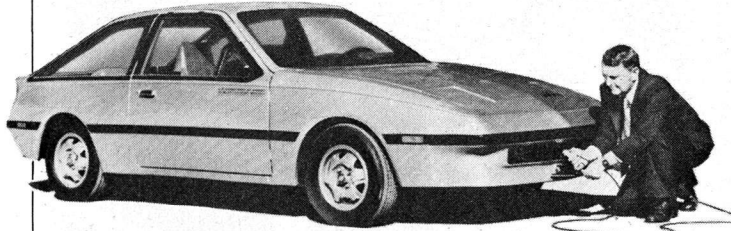
"Unfortunately, there has been so much hoopla about electric cars in the press that the expectation levels are high," says Harhay. "But what we can actually deliver today is not up to that level of expectation."

Donald Ziemer, chief engineer for electric vehicles at General Motors' Truck and Coach Division, on the other hand, questions whether 10,000 electric vehicles—private or commercial—were necessary in the first place. He argues that the pur-

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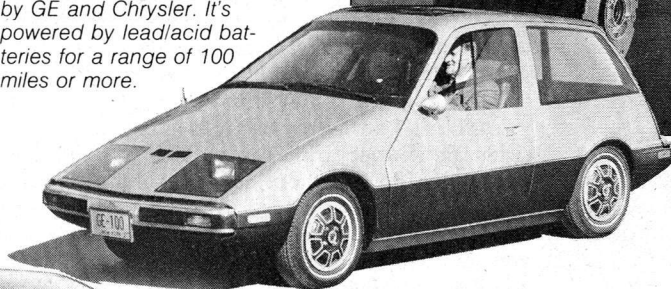


Electric cars from a private manufacturer, U.S. Electricar Corp. in Athol, Massachusetts, on their way to dealer showrooms.

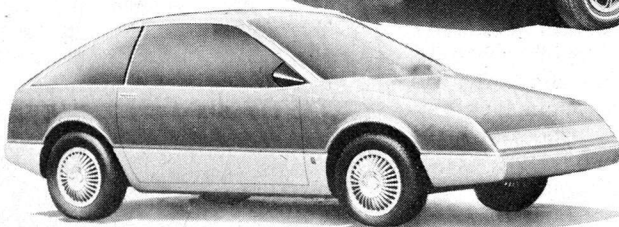


Experimental electric vehicle, the ETV-1, developed for the government by GE and Chrysler. It's powered by leadacid batteries for a range of 100 miles or more.

Beneath the hood of the GM electric car is a bank of nickell zinc batteries for both propulsion and accessories.



Hybrid car being built by GE (above) uses a 45-hp electric motor and a 75-hp gasoline motor, running on either or both as necessary. At left is GE's test vehicle built with off-the-shelf components.



Model of an electric car concept that General Motors is working on at its Electric Car Project Center. Aerodynamics play an important role.

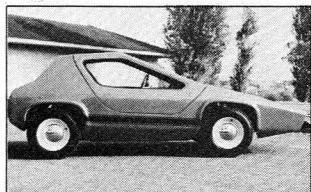
Here Are Ours

The government may be easing out of the electric car arena but MI, in conjunction with Quincy-Lynn Productions, is going strong as ever. To date

there have been over 65,000 sets of plans sold for our electric and hybrid cars, which include the Tri-muter, Urba Electric, Urba Trike, UrbaSport and Urba

Town Car. That translates into a lot of interest in electric cars. Plans are still available for those who want a practical alternative to the family car for short runs around town. For information write to: MI Plans Service, Box MG/2380, 32275 Mally Rd., Madison

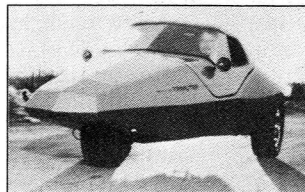
Heights, Mich. 48071. The plans include easy-to-follow instructions with detailed construction drawings on the major steps of building the model you choose. Any person with shop know-how and a few common tools can build the cars in minimal time.



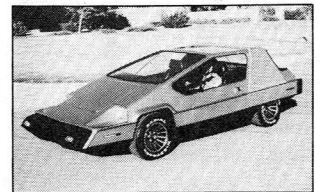
Urba Electric



Urba Trike



UrbaSport



Urba Town Car

ELECTRIC CARS*(Continued from page 50)*

pose of running electric vehicles in the field should be to check their performance, seeking flaws and weaknesses that must be remedied. And he says that the 35 electric vans General Motors supplied under the DOE program to Pacific Bell Telephone and Michigan Bell Telephone have been sufficient for testing. "I think putting the money into the research phase of the program is a much better idea," he says.

Harry W. Mathews, Jr., an Arthur D. Little, Inc. automotive expert, also thinks DOE should be using the demonstration vehicles more extensively to field test equipment, especially new batteries. But he thinks the 10,000-vehicle goal was not necessarily wrong.

"The government's motivation is different than GM's," he says.

"They want to get as many companies as possible involved in electrical vehicles—people do question the program's magnitude, but the government's purpose was to do it on a national basis, to find out how the problems in various parts of the country compare."

Meanwhile, many of the small electric-vehicle companies are disgruntled, not by the demonstration

program's magnitude, but by its untimely death. Major manufacturers must churn out a minimum of 250,000 vehicles a year to turn a profit at a plant, so the demonstration program was of no financial importance to them. But small electric-car companies, ordering engineless bodies (known as gliders) from Detroit or overseas manufacturers, then adding batteries and other modifications, essentially build and sell their vehicles one at a time. For them, the 10,000-car demonstration was a bonanza that fizzled.

With some wanting more demonstration cars, others wanting fewer, this phase of the electric-vehicle program has been caught in a crossfire from the start. For instance, Richard Morrisett, Ford Motor Co.'s manager of strategy for new-product concepts, says: "We weren't particularly excited about the demonstration project." For one thing, some of the earliest electric vehicles (before the government imposed design standards) struck him as dangerous. "I'd be scared to drive them," he says.

Morrisett adds that, if the demonstration program aimed to build enthusiasm for electric vehicles among consumers, it was doomed from the start because the sticker prices are so high. "You're dealing with a product that's up to \$25,000.

Morrisett agrees that the demonstration vehicles should have been earmarked basically for field testing: "The initial thrust of the program was just to throw cars out onto the marketplace to get a little bit of visibility," he says.

Is the federal electric-vehicle program, then, an example of bureaucratic intransigence? Not at all. In fact, despite their criticisms of the demonstration project, industry experts seem to agree that, overall, the electric-car program has been valuable.

Richard Morrisett, for example, says that the program's administrators have listened to criticism from the automotive industry. "They've been pretty good about it, and as a result there has been a closer understanding of what it takes to bring something to the point where you can commercialize it," he says.

Nevertheless, when big bucks are at stake, there will be some biting and scratching. Consider, for instance, the ETV-1.

One way to build an electric car is to eviscerate a standard internal-combustion vehicle and add batteries and an electric motor. The other is to design the electric vehicle from

the ground up, and that was the aim of a contract that the DOE awarded to General Electric. The result was ETV-1 and ETV-2, sleek, streamlined electrics featuring state-of-the-art innards that GE built for about \$8 million apiece. Due next from GE is a hybrid vehicle combining electric and internal-combustion power in one car.

Nobody denies that ETV-1 is the snazziest electric car now on tires. But it makes some smaller manufacturers see red.

"This has been my big criticism of the DOE program," says Warren Harhay. "They funded these big projects, like building ETV-1 with General Electric, and so what? That's \$8 million to demonstrate you can make an electric car go many miles—but, if you can't buy it, what good is it?"

Harry Mathews, of Arthur D. Little, disagrees: "The purpose of ETV-1 was to demonstrate that, if you design an electric from the ground up, you maximize its efficiency," he says. "And not only that, the information then is public, so the smaller companies do receive some benefits."

Dr. Theodore R. Haller, manager of General Electric's electric- and hybrid-vehicle program, points out that, whenever a market for electric cars develops, GE will be ready to produce electric components for the cars. "Some of the technology has rubbed off on us," he says.

But, from the small-company point of view, as Warren Harhay sees it, the problem is simple: "We'd have to say the program has been unsuccessful because there hasn't been enough money to stick to our ribs."

Harry Mathews, however, argues that the only hope for getting the electric-car industry off the ground lies, not with the small companies, but with the major manufacturers like GM, Ford, Chrysler and American Motors. "The small company doesn't have the capital, and the amount required to get into this business is unbelievable," he says.

Oddly enough, even as they grumble that too few of the federal dollars have come their way, many of the smaller electric-car companies agree with Mathews' assessment. "We will celebrate the day one of the major manufacturers comes out with an electric vehicle," says Renette A. Koski, vice president of U.S. Electric Corp. She points out that if GM or Ford markets an electric car, it will endorse the electric-vehicle industry and the

new technology as well.

What, then, is the final judgment on the Department of Energy's electric-car program? Another raspberry for government meddling?

Surprisingly, no. From the executive suites in Detroit to the cramped offices of the small electric-car entrepreneurs, the consensus is that the program has been like a shot of vitamins.

Gripes? To be sure. For instance, the smaller manufacturers look out across the country worriedly and see no network of dealers for electric vehicles, no real market for their products. But Program Director Paul Brown points out that the DOE recently arranged with Mercantile Ford, of Bordentown, New Jersey, and the Electric Vehicle Leasing Co., of Dallas, Texas, to begin setting up a dealer network.

Meanwhile, though, everyone agrees that the market for electrics will be limited until the batteries get stronger, the range increases and the price shrinks. That means research. And it is in that area that the federal dollars have been working hardest.

"At the beginning, we had a range of 35 to 40 miles for an electric vehicle," says Paul J. Brown. "Today we're up to 80 to 90 miles or more in range before you need to recharge."

At Virginia Polytechnic Institute, at Argonne National Laboratories, at NASA's Lewis Research Center, at Chrysler Corp., at the University of Dayton, at the Jet Propulsion Laboratory—at scores of sites across the country—engineers are developing new technologies for electric cars, working through the DOE program. They are designing new types of electric motors, transmissions and batteries.

"Battery development is the key limitation—that comes out loud and clear," says Arthur D. Little's Harry Mathews.

"If you want to put your finger on one item, it's the battery," says GM's Donald Ziemer.

"The sticking point is always the battery," says Warren Harhay.

As the engineers wrestle with such advanced batteries as nickel/zinc, lithium/iron sulfide, nickel/iron, iron/air and aluminum/air, the electric-car industry, half-born, waits. Ordinary car batteries are inadequate because they cannot discharge and recharge 800 times or so. And the batteries used in golf carts and forklifts are too heavy.

"Because of this program, we're making steady progress," says Paul

Brown. "No, we haven't made a breakthrough, some sudden discovery of an entirely new technology, but we don't necessarily need that."

And the automobile industry, forever squinting across the Pacific at the Japanese these days, seems to agree that the federal electric-vehicle program is making a difference. Even some of the small manufacturers who have benefited only minimally from the program say so.

"The question is whether we risk-takers would have done it without the DOE out there urging us on, and I don't know," says Warren Harhay.

"I think the program has been a tremendous asset and a tremendous support to the new technology and a new industry in difficult times," says Renette A. Koski, of U.S. Electric Corp., even though her company's involvement with the DOE program has consisted of no more than supplying a handful of electric cars to the demonstration program.

"I happen to believe in free enterprise, and I hate to see the government involved in any facet of our business," says Ford's Richard Morrissett. "But I don't know if you're ever going to make any progress unless you do have the government involved."

"You can argue whether it was the most efficient way to do it or not, or could they have done it for less money, or should they have spent more money?" says GM's Donald Ziemer. "But, on balance, the research that has been supported in the areas of the propulsion system and particularly the batteries has been very valuable. I'd hate to see any of that just canceled out right now."

"It's a little frustrating to see the tremendous federal cutbacks taking place," says GE's Dr. Theodore Haller. "My hope is that we can at least preserve the value of the work done so far."

Referring to the budget-cutting process, Warren Harhay says: "This year could be the year of the apocalypse or the year of transition."

The ultimate outcome? Harry Mathews' studies have shown that, if gasoline prices skyrocket and if there is a return to gas lines, a surprising number of drivers across the country will buy electric.

Says Mathews: "The American people still don't want anyone holding them up." **MI**

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