The Electric-Car Slide

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Steven Dibner drove the thinking man's hot rod. Instead of roaring with power and guzzling gas, his car whispered along on rechargeable batteries.

But make no mistake, Dibner's all-electric GM coupe could zoom away from a stoplight with drag-strip speed. He was saving money on fuel, causing no pollution and "driving the coolest, sexiest, most interesting car on the road," said Dibner, a bassoonist with the San Francisco Symphony.

General Motors Corp. built 1,100 of the two-seater EV1s beginning in 1997, pushing electric-car technology further than it had ever gone in a mass-produced vehicle. But to the dismay of Dibner and other alternative-fuel advocates, GM has canceled the program and is confiscating all the cars.

The auto industry's electric-car movement—which gained momentum in the 1990s thanks to a push by California regulators—is now all but dead. GM and other major automakers are abandoning their efforts to produce a battery-powered car for the mass market.

Instead, they are focusing on hybrid vehicles that boost the mileage of a gasoline engine with the use of some electric power. Ultimately, the industry hopes—perhaps decades from now—to offer vehicles powered by hydrogen fuel cells, a fledgling auto technology that delivers power by converting hydrogen to water.

The death knell for pure electric cars sounded this summer when California's regulators, responding to industry arguments that battery power wasn't economically feasible, backed away from stringent antipollution rules that had accelerated the vehicles' development. Toyota Motor Corp., Honda Motor Co., Nissan Motor Co., Ford Motor Co. and DaimlerChrysler AG all have canceled electric-car programs this year.

GM is now taking back EV1s as their leases run out. Battery-power enthusiasts staged a mock funeral for their cars in July in a Hollywood cemetery, complete with a hearse and bagpipes.

Dozens of EV1 drivers have sent GM $500 checks to beg for more time, but the company returned their money. About 100 of the cars will go to the state of New York for research on battery performance in cold weather. A few others are going to museums, and the rest of the EV1 fleet will be scavenged for parts or scrapped.

Automakers say that electric vehicles cost too much to manufacture and that batteries will never provide as much driving range as a full tank of gas. The internal-combustion engine simply has a lock on American driving habits—it is the rare car buyer, the reasoning goes, who will accept having to tether a vehicle to a power outlet for hours to refuel it when a quick visit to a gas pump is still possible.

But scientists who have spent careers working on batteries say the auto industry is retreating just as progress in battery technology is finally pushing toward a breakthrough. Battery life is extending rapidly, and electric cars' performance and styling have edged ever closer to their gas cousins. The mass market “could have battery-powered cars in five years or less,” said Tom Gage, president of AC Propulsion Inc., a California company developing technology for electric cars.

What's needed, Gage said, is a commitment from just one major corporation to use its might to shove past the last few hurdles, such as manufacturing new batteries in big enough numbers to bring down their cost.

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Battery supporters, whose ranks include major names from industry and science, insist that the promise of electric will yet bear fruit—in future hybrid vehicles that rely more on electricity than gasoline, in commercial uses such as fleets of delivery vans, and ultimately in a return to mass-market battery-powered cars.

“Some of us still believe in electric drive and pure battery power,” said Robert C. Stempel, the former GM chairman and chief executive who helped start the EV1 program. Forced out in the early 1990s, Stempel now runs a company that develops batteries and alternative automotive technology.

“What goes around comes around,” he said. “We'll see where they wind up eventually.”

Electric cars are nothing new. In the late 1800s, electricity vied with steam and internal combustion for the top spot in new automotive technology. Henry Ford’s wife drove electric cars, and the clean, quiet vehicles were cast as products for genteel society women.

But there was a problem that even Thomas Edison couldn’t solve, and it has continually held back electric-car development: Batteries haven’t been able to compete with the driving range of a full tank of gas.

In the late 1980s, GM seemed to find a way around the problem when it teamed with a California company called AeroVironment Inc. to build a solar-powered electric car for a race in Australia. Founded by legendary inventor Paul MacCready, the man whose Gossamer Albatross and Gossamer Condor aircraft set records for human-powered flight, GM's aerodynamic and engineering and made world headlines.

The partnership even earned the current GM research chief the title “remains the world’s number one battery expert.”

The EV1’s rear wheel drive, with a power plant creating a teardrop shape, enabled the car to accelerate and overcome battery limits while achieving roughly 100 miles on a charge.

It also had no gears to deal with, so the EV1 accelerated from zero to 60 mph in a fraction of the time it took a Mustang. It was capable of nearly 200 mph.

While the EV1 was impressive, it was relatively easy drawing up the national consciousness requiring that 10 percent of autos sold would be electric. That pushed all automakers to design vehicles quickly.

The backlash from the auto industry and the oil industry—“every way you can think of” to gain California Air Resource Board’s favor, one industry executive claimed—led to a wave of electric-car development. The firms lobbied state and federal officials, newspapers and on television, calling for a federal mandate that a certain percentage of vehicles sold in the country be electric. They claimed that electric cars would help the environment and reduce the country’s dependence on foreign oil.

“Isn’t it better for Detroit to make a profit building electric cars than for an industrial nation like China or Japan to do it?”\(^{2}\)

Car manufacturers could see a profit in building electric cars, but they couldn’t predict the future. As the cost of gasoline rose, traditionalists realized that the internal-combustion engine could stay in the driver’s seat, at least for the next few years.\(^{3}\)

“Car manufacturers are looking to the future,” said Joe McNamara, president of the National Association of Auto Dealers. “They want to be in a position to build the car of the future. If the electric car is the car of the future, then they want to be there to build it.”

But what about the future of the electric car? As McNamara pointed out, the internal-combustion engine is not likely to go away anytime soon. And electric cars, even with their range limitations, are no longer in the dark ages.

**"There is the idea that electric cars are the future. They are not. They are a necessity. They are a way to move toward a cleaner environment."**


\(^{2}\) This is a reference to the industrial nation of China or Japan.

\(^{3}\) This is a reference to the future of the electric car.
human-powered flight, AeroVironment helped design a vehicle so aerodynamic and energy-efficient that it blew away the competition and made world headlines.

The partnership eventually led to the design for the EV1, which current GM research-and-development chief Larry Burns said "remains the world’s most efficient production vehicle."

The EV1’s rear wheels were set closer together than the front, creating a teardrop shape with little wind resistance. Combined with new lightweight materials and electronic controls, the design overcame battery limitations to result in a vehicle that could go roughly 100 miles on a two-to-four-hour charge.

It also had no gears to shift and delivered full power instantly, so the EV1 accelerated from zero to 60 mph in 8.5 seconds—comparable to some Mustangs and performance cars. Test versions reached nearly 200 mph.

While the EV1 was being developed, the state of California was drawing up the nation’s most stringent clean-air requirements—

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—Charles Hyde, historian, Wayne State University

requiring that 10 percent of new cars be emission-free by 2003. That pushed all automakers to develop electric vehicles, and quickly.

The backlash from the industry was ferocious. Car companies—and the oil industry—fought California’s electric-car mandate "every way you can think of," said Jerry Martin, spokesman for the California Air Resources Board.

The firms lobbied state and federal lawmakers. They ran ads in newspapers and on television, warning consumers that the electric car mandate would drive up prices on all vehicles. Executives testified before the state board that battery technology wouldn’t work. GM filed suit in 2001 to stop the state’s plans and then embarked on a campaign of media interviews and statehouse lobbying to claim that electric cars wouldn’t meet safety standards, wouldn’t really contribute to clean air and had no viable consumer market.

“There is that whole collection of business interests that certainly don’t want to see the gasoline-powered car disappear,” said historian Charles Hyde, a professor at Wayne State University in Detroit. “I have a gut feeling that if electric cars really became more and more viable, you’d suddenly start to see gasoline prices really go down, to keep people in tow.”
The new frontier is lithium-ion batteries—the kind that power cell phones and laptops.

Lighter and more efficient, lithium-ion batteries have not yet been incorporated into mass production in America, and they are not expected to be the battery of choice for EVs anytime soon, despite recent claims.

Designed for sports cars, these batteries can drive greater than 300 miles on a charge and reach speeds of 100 miles per hour in 3.6 seconds. Yet, they have not been adopted by mainstream manufacturers.

"Originally, we had thought that we could develop technology that they've essentially abandoned, but the opportunity for mainstream use seems to be there," said one battery expert.

"I think the battery needs to be a little more practical for a typical car owner to use, and that's more of a cost issue than whether or not the technology is there, because you can buy a cell phone for that cost," he said.

"At the end of the day, it's just a matter of knowing what you want to do with the technology and how you want to use it," the expert continued.

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Battery power. The Bush administration's program of Energy Department-sponsored investments in energy technology has attracted a battery research component into a bigger program to develop hydrogen fuel cells. The program's goals are to make hydrogen vehicles cheaper than conventional gasoline-powered ones by the end of the decade.

As they fought California's regulations, carmakers had to offer electric vehicles. The programs were funded by the Energy Department, the DOE, and the California Air Resources Board (CARB). The DOE programs included the development of advanced battery technologies, such as lithium-ion batteries, which are cheaper and more durable than traditional lead-acid batteries. The DOE also funded the development of hydrogen fuel cell vehicles, which are powered by hydrogen gas and produce only water as a byproduct.

“Lithium-ion batteries will eventually be found to be the good substitute for gasoline-powered cars,” said MacCready, who is a retired bank employee. “But we need to develop technology that will make them cheaper and more reliable.”

The best car we ever had, he said, was the Tzero, a sports car that can go from zero to 60 mph in 3.6 seconds and costs $220,000, and it's not a mass-market vehicle, but its designers believe it's a start.

“Originally, we had thought that with the car companies involved we could develop technology they'd be interested in buying. Now that they've essentially abandoned the market, we're looking at the possibility of marketing electric vehicles in low volume,” said Gage, the AC Propulsion president.

At the same time, the Northern Virginia-based New Generation Motors Corp. is poised to announce a contract to mass-produce electric vehicles in India. While those cars will have a range and speed suitable for the average Indian's 15-mile commute, the technology could scale up to an EV1-like level, said Eric Takamura, director of manufacturing and engineering at New Generation.

“I think the battery technology is already there, as far as being practical for a typical commuter car,” Takamura said. “It is really more of a costing issue. Without people actually going out there and buying it, you can't get the volumes up enough to bring down the cost.”