

The Suspects

1) Consumers: Guilty

Guilty with Mitigating Circumstances, that is. While consumers failed to embrace the electric vehicle in the era of cheap gas and big SUVs, auto producers and opinion makers like the press did little to convince them otherwise. Questionable advertising, limited availability, weak first-generation battery technology, and simple lack of awareness gave consumers little incentive to consider EVs as a practical alternative to gas cars.

It was also argued that the EV was elitist by "grassroots" organizations like Californians Against Hidden Taxes, which was funded primarily by the Western Petroleum States Association oil lobby. With the EV1's launch in December 1996, the organization's spokeswoman, Anita M. Mangels, wrote a newspaper commentary entitled, "Electric vehicles: Everyone pays, but only the elite will drive" wherein she claimed that "the EV-1 is the flagship of what promises to be an armada poised to cruise Easy Street at taxpayer expense." Although the cost of a monthly lease was moderate, many EV drivers considered it a commute car, and had another conventional gas car for longer-distance trips. But the EV's benefits to air quality were shared by everyone, regardless of income level.

2) Batteries: Not Guilty

The battery is often the scapegoat in justifying the failure of the EV. Not powerful enough. Too many technological hurdles. Too expensive. Just shifted the burden of pollution from the car's tailpipe to the power plant's smokestack. These charges are unconvincing.

Battery power: The GM EV1 was commercially released in 1996 with an underperforming lead-acid battery that powered the car only 60-80 miles to a charge. According to the Bureau of Transportation Statistics, Americans drive an average of 29 miles a day. But the range of the first generation of EV1s was still seen as inadequate and impractical for many drivers, and led analysts and the public to dismiss the technology. Two years later, the nickel-metal hydride (NiMH) battery, developed by Stanford R. Ovshinsky's Ovonics battery company, was used in second-generation EV1s. With the NiMH battery, the EV1 was able to travel 100 - 120 miles per charge. In 1994 GM had already acquired a 60% interest in the Ovonics, and could have adopted these

powerful NiMH batteries more quickly, given the demonstrated performance of NiMH batteries in prototype electric vehicles.

Technological hurdles: GM claimed that the NiMH battery required extensive flammability testing, the development of a cooling system, and other technology solutions before it could be used in the EV1. All true. But if GM had had the will and commitment to pursue an innovative, practical, and successful electric vehicle, it could have made the effort to quickly and efficiently overcome these hurdles.

Battery expense: The NiMH batteries used in later-version EV1s were expensive—but less costly, in the long run, than an internal combustion engine. With no moving parts to maintain or repair, the battery lasted the life of the car (especially since the car's life was abruptly terminated before its time). GM never mass-produced the NiMH batteries, which would have reduced their cost. Toyota currently uses NiMH batteries in the highly successful Prius.

Pollution at the power plant: See "The Long Tailpipe Theory" in the Fact Sheet.

Battery Postscript: A new generation of Lithium-ion batteries power electric cars in development today. They are twice as energy efficient as hydrogen fuel cells and can provide 250 to 300 miles per charge. Currently they are extremely expensive.

3) Oil Companies: Guilty

Why did oil companies fight so hard to stop funding of public charging stations? Why did Mobil take out full-page national newspaper ads critiquing the merits of electric cars? Why did oil industry lobbyists pressure legislators? Electric cars may not have been a short-term threat, but if they caught on, they certainly could have become one.

The oil industry sells nearly 3 billion gallons of gasoline per week in the U.S. According to the Environmental Protection Agency, commuters alone spent \$60 billion on gasoline in 2004. As the world demand for transportation fuel increases, a lack of alternatives keeps prices and profitability going up.

Combined Profits of Exxon-Mobil, Chevron-Texaco, Conoco-Phillips
2003: \$33 Billion
2004: \$47 Billion
2005: \$64 Billion

4) Car Companies: Guilty

GM, Ford, Honda, Chrysler, Nissan, and Toyota all developed electric vehicle programs in response to California's zero emission mandate—and most ended up crushing at least part of their EV fleets. Even as the automakers launched their EV programs, they undermined their success every step of the way. Why?

Electric cars are a threat to the profitability of the conventional gas-powered auto industry. GM said that it spent more than \$1 billion to market and develop the EV1. Not only would a successful electric car program cannibalize sales of conventional cars, but the electric car costs the auto industry in other ways: lacking an engine, it saves the driver the cost of replacement parts, motor oil, filters, and spark plugs. The EV1's regenerative braking system, in which the car's electronic controls handled much of the work of slowing down the car, spared the car's mechanical brake system from wear. Brake parts and repair is a billion-plus dollar industry alone. The EV1's efficiency was a winner for consumers but a loser for the auto industry.

When GM introduced the EV1, it was years ahead of American and Japanese competition in electric car technology. In the coming years it could have capitalized on its lead by developing these cars and advanced hybrids. Instead GM and other US carmakers would focus on battling with the State of California to kill electric vehicles. The consequences of these decisions reverberate today.

5) Government: Guilty

In October 2002, the **Bush administration** joined automakers and car dealers in their lawsuit against the California Air Resources Board's Zero Emission Vehicle (ZEV) mandate, arguing that it amounted to an attempt to regulate fuel economy, which only the federal government has the authority to do. From 1990 to 2004, seven other states adopted California's stringent ZEV mandate. Then, in April 2004, the California Air Resources Board further modified its ZEV mandate, effectively eliminating electric cars from the clean air equation.

The Bush administration's antagonism to the electric vehicle is perhaps unsurprising, given its links to the oil and automotive industries. For example, Bush's former Chief of Staff Andrew Card had been a GM Vice President, and was President and CEO of the American Automobile Manufacturers Association during its assault on the ZEV

mandate in California (see "Bush Administration Links to the Oil and Auto Industries" in the Fact Sheet).

The last time fuel efficiency was really a federal priority came during the **Carter administration** as a result of the OPEC oil embargo. Under the Corporate Average Fuel Economy (CAFE) standards, fuel economy increased by more than 50% between 1975 and 1985. Then in the mid-80s, the price of oil plummeted. Some saw this as a deliberate strategy by the Saudis and OPEC to ensure America's continuing dependence on oil. With cheap oil and a Reagan administration that was, at best, indifferent to conservation (signaled when it tore solar panels installed by Jimmy Carter off the White House roof), advances in fuel economy were stopped cold. Fuel economy and alternatives to oil have been politically unattractive for ever since.

Even under the **Clinton administration**, CAFE standards remained unchanged. Clinton gambled on a "Partnership for a New Generation of Vehicles" (PNGV), a public-private collaboration involving automakers, universities and the federal government. PNGV put forth \$1.5 billion dollars to develop, by 2004, a family-sized car that could get 80 miles per gallon. Half a billion in government funds were earmarked to develop hybrid vehicle technology. But critics noted that the program was a convenient way to avoid raising corporate average fuel economy (CAFE) standards. In January 2002, with George W. Bush now in office, Clinton's program was terminated and replaced with the FreedomCAR (Cooperative Automotive Research), a federal program that subsidizes the development of hydrogen fuel cell technology.

Japan, meanwhile, was continuing to make strides with hybrid vehicle technology, and Toyota and Honda grabbed the first and largest hybrid market share, with the American launch of the Toyota Prius in 2000 and Honda Insight in 1999. American car companies have responded to the success of the Toyota Prius by developing their own hybrid vehicles, but they are far behind. In fuel efficiency, American hybrids are barely an improvement over conventional gas cars.

With the American public increasingly alarmed over the price of oil and the war in Iraq, the Bush administration signaled a policy shift in the January 31, 2006 State of the Union Address. President Bush called for increasing research on better batteries for hybrid and electric cars, and for development of alternative energies for cars. Whether this will be pursued remains to be seen.

6) California Air Resources Board: Guilty

While the California Air Resource Board's leadership galvanized the development of the electric vehicle, CARB failed to steer the ZEV initiative to success. Beset by industry and political pressure, CARB ultimately let the auto and oil industries off the hook by eliminating electrical vehicle production from the mandate. CARB Chairman (1999-2004) Alan C. Lloyd, Ph.D., in particular may bear the brunt of the guilty verdict: the board operates on a consensus mode, in which the chairman directs policy and other board members follow his lead. Four months before the CARB meeting that effectively killed the electric car, Lloyd became the chairman of the California Fuel Cell Partnership, a consortium of automakers and public agencies that promotes the development of hydrogen fuel cell vehicles and infrastructure. In his interview filmed for this documentary, Lloyd states that he remains convinced that the ZEV mandate was not feasible.

7) Hydrogen Fuel Cell: Guilty

The electric car "mandate" in California was abandoned in favor of a new zero emission vehicle technology, the hydrogen fuel cell. Proponents, like the California Air Resources Board, argued that it could prove a better technology. Unlike battery electric cars, however, it was far from being a proven technology. And supporters and detractors both agree that a practical H₂ car is decades away from reality (See "5 Conditions Required for a Viable Hydrogen Fuel-Cell Vehicle" in the Fact Sheet).

Hydrogen has another issue. At this time, it is much more efficient and non-polluting to use electricity directly in a battery than to turn it into a hydrogen fuel. The hydrogen fuel cell is attractive to the oil and auto industries because most hydrogen is made from fossil fuels. Even if hydrogen were made from renewable electricity, it would still be delivered as a fuel—instead of via an electric utility. By touting Hydrogen Fuel Cell cars as the great hope of the future, political leaders who are beholden to the oil and auto lobbies can appear to value innovation and conservation while promoting these lobbies' interests.