WHO KILLED THE ELECTRIC CAR?

Directed by Chris Paine

A SONY PICTURES CLASSICS RELEASE

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Synopsis

It was among the fastest, most efficient production cars ever built. It ran on electricity, produced no emissions and catapulted American technology to the forefront of the automotive industry. The lucky few who drove it never wanted to give it up. So why did General Motors crush its fleet of EV1 electric vehicles in the Arizona desert?

WHO KILLED THE ELECTRIC CAR? chronicles the life and mysterious death of the GM EV1, examining its cultural and economic ripple effects and how they reverberated through the halls of government and big business.

The year is 1990. California is in a pollution crisis. Smog threatens public health. Desperate for a solution, the California Air Resources Board (CARB) targets the source of its problem: auto exhaust. Inspired by a recent announcement from General Motors about an electric vehicle prototype, the Zero Emissions Mandate (ZEV) is born. It required 2% of new vehicles sold in California to be emission-free by 1998, 10% by 2003. It is the most radical smog-fighting mandate since the catalytic converter.

With a jump on the competition thanks to its speed-record-breaking electric concept car, GM launches its EV1 electric vehicle in 1996. It was a revolutionary modern car, requiring no gas, no oil changes, no mufflers, and rare brake maintenance (a billion-dollar industry unto itself). A typical maintenance checkup for the EV1 consisted of replenishing the windshield washer fluid and a tire rotation.

But the fanfare surrounding the EV1's launch disappeared and the cars followed. Was it lack of consumer demand as carmakers claimed, or were other persuasive forces at work?

Fast forward to 6 years later... The fleet is gone. EV charging stations dot the California landscape like tombstones, collecting dust and spider webs. How could this happen? Did anyone bother to examine the evidence? Yes, in fact, someone did. And it was murder.

The electric car threatened the status quo. The truth behind its demise resembles the climactic outcome of Agatha Christie's Murder on the Orient Express: multiple suspects, each taking their turn with the knife. *WHO KILLED THE ELECTRIC CAR?* interviews and investigates automakers, legislators, engineers, consumers and car enthusiasts

from Los Angeles to Detroit, to work through motives and alibis, and to piece the complex puzzle together.

WHO KILLED THE ELECTRIC CAR? is not just about the EV1. It's about how this allegory for failure—reflected in today's oil prices and air quality—can also be a shining symbol of society's potential to better itself and the world around it. While there's plenty of outrage for lost time, there's also time for renewal as technology is reborn in *WHO KILLED THE ELECTRIC CAR?*

Director’s Statement

Here's what happened: I fell in love with my car.

I've never been a car guy but that all changed when General Motors leased me its all-electric car, the EV1, in 1997.

Designed by one of my childhood heroes, Paul MacCready, who had also designed some of the most famous airplanes in the world, the EV1 was truly 21st century. It was fast, quiet, ran without exhaust, and meant I never had to go to the gas station. It made me feel like the 21st century had arrived.

I thought it would be my second car, but within days, it was my primary car. I drove it everywhere. And everywhere I went, people wanted to ride in it. $3 to fill up on electricity and you charged it overnight. I quickly joined the ranks of those who had driven and loved electric cars.

But deep and mysterious currents were stirring. Politics, economics and corporate power stopped California's electric car program in its tracks. Then the carmakers started taking our cars off the road. I thought about stealing mine, but the prospect of a felony and legal fees gave me pause.

So when our best efforts failed and our cars started disappearing, there was only one thing left I could think to do: get this apparently forgotten story to the press.

Where were the major investigative news programs on this story? Not only had billions been invested, but hundreds of amazing engineers, citizens, politicians, and corporations had been involved in getting chargers installed and cars on the road all over California.

And then I realized that no one had ever put the actual pieces of this puzzle together. And no one was going to. What began as a series of questions began to turn the story into a murder mystery. Some of the evidence in this story still shocks me.

As we put the whole chain of events together, I realized our tale was a lot more then just a car story. It demonstrated why America is having such a tough time getting out of the 20th century and breaking its addiction to gasoline. - Chris Paine

Onscreen Contributors

The following people were interviewed for WHO KILLED THE ELECTRIC CAR?

Dave Barthmuss: GM Communications spokesman

Dave Barthmuss is the Manager of Public Policy, Environment, and Technology Communications for General Motors Corporation.

Jim Boyd: Executive Officer, California Air Resources Board, 1981-96

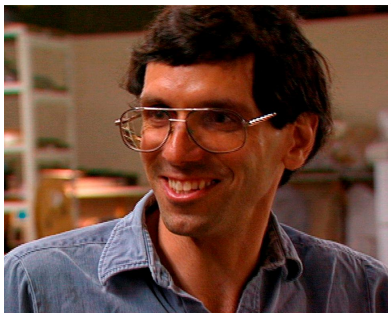
James D. Boyd was appointed to the California Energy Commission on February 6, 2002, by Governor Gray Davis to serve a five-year term. Commissioner Boyd presides over the Energy Commission's Transportation and Fuels Committee and oversees Climate Change and International Export Programs. He also presides over the Natural Gas Committee which includes the Energy Commission's work on Liquefied Natural Gas (LNG). He was the Associate Member of the committee overseeing the preparation of the Energy Commission's 2005 Integrated Energy Policy Report. He is the Associate Member of the Siting Committee, serves as the state's liaison to the Nuclear Regulatory Commission and California's representative on the Border Governors' Conference Energy Worktable, and is the Energy Commission's representative on the Steering Team of the California Fuel Cell Partnership and the Board of Directors of WestStart/CALSTART. Additionally, he is on the Board of Advisors of the University of California Davis' Institute of Transportation Studies. He served on the Governor's Hydrogen Highway Network Implementation Advisory Panel and presently serves on the Governor's Climate Action Team. He presently leads the Bio-energy Interagency Working Group that developed and is now implementing the Governor's Bio-energy Action Plan. He is overseeing the Commission's efforts to develop alternative transportation fuels plans requested by the Governor and Legislature.

Prior to his appointment, Commissioner Boyd was Deputy Secretary and Chief of Staff of the California Resources Agency. He created and chaired the state's first Joint Agency Climate Change Team and the state's Natural Gas Working Group. He served 15 years as the Chief Executive Officer of the California Air Resources Board (CARB), directing the nation's largest state air pollution control program. During this period, CARB led the nation in establishing new pollution control programs for motor vehicles and fuels, toxic air contaminants, consumer products, and industrial and area sources. A California native, Commissioner Boyd received his Bachelor of Science degree in Business Administration from the University of California, Berkeley.

Alec N. Brooks: Chief Engineer, AeroVironment

Alec Brooks has been involved with electric and hybrid vehicles for almost 20 years in the areas of technology, public policy, and as a driver. At AeroVironment he led the development of the GM SunRaycer solar racing car in 1987, and later led the development of the GM Impact electric vehicle, the forerunner of the EV1. At AC Propulsion, he spearheaded the development of concepts by which connected vehicles would supply grid ancillary service functions for the benefit of the power grid and to create value for the vehicle owner. He has a bachelor of science degree from the University of California, Berkeley, and Masters and Ph.D degrees from Caltech, all in Civil Engineering.

Alan Cocconi: Drive System Engineer, Impact (EV1 prototype)



AC Propulsion founder and president, Alan Cocconi, received his engineering degree from the California Institute of Technology. As an engineering consultant, he developed the drive and solar tracking systems for the GM SunRaycer which won the 1987 World Solar Challenge, a cross-country race for solar powered vehicles held in Australia. Mr. Cocconi then designed and built the controller for the original GM Impact that was introduced at the 1990 LA Auto Show and which has since evolved into GM's EV-1. In addition to being DWRA's electric power consultant, Mr. Cocconi also designed White Lightning's two AC150 drive trains, modified to operate at higher voltage.

John R. Dabels: Former GM EV Marketing Director

The former Marketing Director for GM's EV division, John R. Dabels is now the founder and CEO of EcoVehicle Enterprises, Incorporated. Mr. Dabels has had extensive automotive and management experience, including 25+ years with General Motors in finance and marketing, including Director of Marketing for Buick Division and Director of Worldwide Market Development for the GM Electric Vehicle Program. Since 1993, Mr. Dabels has been helping develop, introduce and manage companies offering electric-powered vehicles. EcoVehicle evolved from these efforts. Knowledge of markets for electric vehicles results from extensive primary and secondary research and lots of bruises. Mr. Dabels is a graduate of Drake University, Des Moines, IA and Massachusetts Institute of Technology, Cambridge, MA, where he was an Alfred P. Sloan Fellow.

Phyllis Diller: Comic who remembers early pre-1920 EVs

Phyllis Diller, an irrepressible lady with an outrageous laugh, is recognized as the leading female standup comic in the world today. She has starred on television, in movies, and on the stage, and has

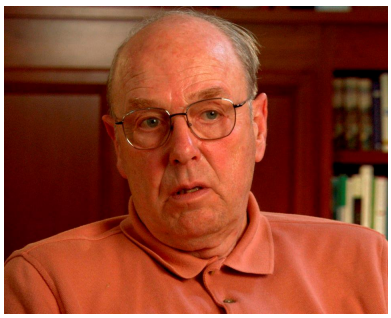
headlined in venues all around the world as a professional comic. She began her career with a night club act at San Fransisco's Purple Onion. From there she skyrocketed to fame, starring in television shows, films, and stage productions, as well as penning four best-selling books and appearing with over 100 symphony orchestras as a piano soloist. In the course of her career, Ms. Diller has won many awards in recognition of her talent and her patriotic and philanthropic activities. She is a former honorary mayor of Brentwood, California and has received a Ph.D. degrees in Humane Letters from National Christian University in Dallas and her Alma Mater, Bluffton College in Ohio, as well as Doctorate from Kent State. Other honors include the 1993 Lifetime Humor Award by the National Humor Institute, being inducted into the Ohio Women's Hall of Fame for her contribution as an entertainer, author, and actress, as well as a star on Hollywood Boulevard.

Colette Divine: EV driver

Colette Divine is an actor, stand up comic, writer, director, activist and occasional model. She is grateful to have been directed by; Mike Figgis in Timecode, Jay Roach in Austin Powers II, The Spy Who Shagged Me, as well as Michael Bay and Errol Morris. She can be seen in the newcomer Tamika Miller's films "Gift for the Living," and "Sarang Song." Both films air on cable's Showtime (sho.com) as part of their Black Filmmaker's Showcase. Colette is proud to appear in Who Killed the Electric Car? with her partner J.Karen Thomas. Colette became active in the alternative fuel vehicle movement when she purchased a Toyota RAV4 EV in 2004, going so far as to being arrested on March 15, 2005 with fellow actress/activist Alexandra Paul. Colette is also committed to being of service to communities who promote education and diversity, volunteering for TreePeople (treepeople.org), BookPALS (bookpals.net), Outfest, L.A. (outfest.org), and POWER UP (power-up.net).

In February 2006 Ms. Divine was a Director Mentee on the film; Itty Bitty Titty Committee, directed by Jamie Babbit (But I'm A Cheerleader). This has led Colette into talks on directing a theatre production in Hollywood that will open in late 2006. She is also performing Stand Up at various L.A. comedy clubs and writing her first book. Finally, in June/July 2006 Colette and J.Karen are combining their star-power to launch Eco RockStar! a line of hip, comfy, socially and environmentally conscious t-shirts. (ecorockstar.com)

Tom Everhart, Ph.D: Former GM board member, 1989 – 2002

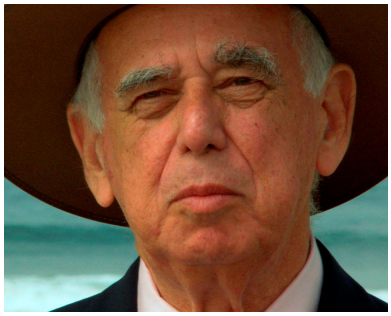


Born in Kansas City, Missouri, Thomas Everhart attended Harvard University and was graduated magna cum laude in 1953 with an A.B. degree in physics. He attended UCLA and received an M.S. degree in applied physics in 1955, and from there went on to Cambridge University and was awarded an engineering doctorate in 1958 for his research on the scanning electron microscope. Upon his return to the States, Dr. Everhart assumed the position of assistant professor in the Department of Electrical Engineering at the University of California, Berkeley. In 1979, Dr.

Everhart was named dean of the College of Electrical Engineering at Cornell University, where he also served as professor in the department for five years. From 1984 to 1989, Dr. Everhart served as chancellor at the University of Illinois at Urbana-Champaign and concurrently held the position of professor of electrical and computer engineering. Since 1987, Dr. Everhart has served as president of the California Institute of Technology in Pasadena, California, and as professor of electrical engineering and applied physics at that institution.

In addition to leadership within the academic community, Dr. Everhart is closely involved with industry, serving on the board of directors for General Motors and Hewlett-Packard. He also serves as a member of the National Academy of Engineering Council, and on the executive committee of the Council on Competitiveness. Dr. Everhart is the recipient of numerous awards and honors including the Institute of Electrical and Electronic engineers 1984 Centennial Medal, a John Simon Guggenheim Memorial Fellowship, and the Benjamin Garver Lamme Award. He was named a fellow to the American Academy of Arts and Sciences in 1990, and also received honorary degrees from Illinois Wesleyan University, Pepperdine University, and the Colorado School of Mines that year.

S. David Freeman: Former Energy Advisor to Jimmy Carter



S. David Freeman has a 30-year record as board member and manager of many of America's largest publicly owned businesses. President Jimmy Carter appointed Freeman as chairman of the Tennessee Valley Authority in 1977, where he cut sulfur oxide emissions in half. He then served as general manager of large public power agencies for the next two decades, including the Los Angeles Department of Water and Power, from 1997 to 2001. Under his leadership, the DWP kept the rates level and lights on during California's power crisis.

Freeman has won awards from the Los Angeles Coalition for Clean Air, National Wildlife Association and Global Green for his devotion to clean air, clean water, and renewable energy. He negotiated the settlement of the decades-long dispute over the dust pollution from the Owens (Dry) Lake, resulting in the restoration effort that has created a bird sanctuary and cleaner air for that pristine area. Freeman served as a U.S. Merchant Marine in World War II, transporting gasoline across the North Atlantic. He authored Energy: the New Era in 1974, holds a B.S. in Civil Engineering from Georgia Tech, and an L.L.B. from the University of Tennessee.

Frank J. Gaffney Jr.: Dep. Assistant Secretary of Defense (1983-1987), Reagan administration

Frank Gaffney is the founder and president of the Center for Security Policy in Washington, D.C. The Center is a not-for-profit, non-partisan educational corporation established in 1988. Under Mr. Gaffney's leadership, the Center has been nationally and internationally recognized as a resource for timely, informed and penetrating analyses of foreign and defense policy matters. Mr. Gaffney also contributes actively to these debates in his capacity as a columnist

for the Washington Times, Jewish World Review and TownHall.com. He is also a contributing editor to National Review Online. He is a featured weekly contributor to Hugh Hewitt's nationally syndicated radio program and the Monica Crowley Show on WABC and appears frequently on national and international television and radio programs.

In April 1987, Mr. Gaffney was nominated by President Reagan to become the Assistant Secretary of Defense for International Security Policy. From August 1983 until November 1987, Mr. Gaffney was the Deputy Assistant Secretary of Defense for Nuclear Forces and Arms Control Policy under Assistant Secretary Richard Perle. From February 1981 to August 1983, Mr. Gaffney was a Professional Staff Member on the Senate Armed Services Committee, chaired by Senator John Tower (R-Texas). In the latter 1970's, Mr. Gaffney served as an aide to the late Senator Henry M. "Scoop" Jackson (D-Washington) in the areas of defense and foreign policy. Mr. Gaffney holds a Master of Arts degree in International Studies from the Johns Hopkins University School of Advanced International Studies and a Bachelor of Science in Foreign Service from the Georgetown University School of Foreign Service. Mr. Gaffney was born in 1953 and resides in the Washington area.

Mel Gibson: EV driver

Mel Gibson was born in upstate New York and moved with his family to Australia when he was 12 years old. Gibson attended the National Institute of Dramatic Arts at the University of New South Wales in Sydney. Gibson was eventually brought to the attention of director George Miller who cast him in "Mad Max," the film that first brought him worldwide recognition. This was followed by the title role in "Tim," and the two hit sequels to "Mad Max"--"The Road Warrior" and "Mad Max Beyond Thunderdome." Gibson made his American film debut in "The River." He went on to star in the worldwide record breaking "Lethal Weapon" (1,2,3 and 4) franchise, "The Bounty," "Mrs. Soffel," "Tequila Sunrise," "Bird on a Wire," "Air America," and "Hamlet."

Gibson also began a production company, Icon Productions, to make films that would include HAMLET, FOREVER YOUNG, MAVERICK. THE MAN WITHOUT A FACE (Gibson's directorial debut), the five time Academy Award winning BRAVEHEART, PAYBACK, and WHAT WOMEN WANT. Gibson also starred in highly successful films that include CONSPIRACY THEORY, THE PATRIOT, WHEN WE WERE SOLDIERS, CHICKEN RUN, and SIGNS. Most recently, Gibson produced, co-wrote and directed "The Passion of The Christ" starring Jim Caviezel, Maia Morgenstern and Monica Bellucci. "The Passion of The Christ" had a worldwide box-office gross of $610 million, making it the highest-grossing R-rated film and highest grossing independent film in film history.

Greg Hanssen, President EDrive Systems LLC, V.P. Engineering EnergyCS

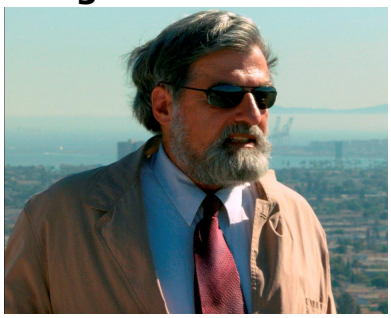
Greg Hanssen is the co-founder and has been the principal engineer for EnergyCS (Energy Control Systems Engineering, which provides leading edge consulting, design and prototyping services for system integration, management and monitoring of

electrochemical energy systems such as batteries and fuel cells, focusing on applications in the areas of EV and HEV transportation and alternative energy). He has had twenty-five years of experience in microprocessor, microcontroller and DSP software development. From 1993-2001 he was a digital electronics entrepreneur. Greg has been an EV driver since 1997, and he has been the Co-chairman of Production for the EV Drivers Coalition. Greg was also the lead developer and programmer for the EnergyCS/EDrive Plug-in Hybrid Prius.

Peter Horton: EV driver

Born in Bellevue, Washington, he is best known for his role as Prof. Gary Shepherd on the popular television series "thirtysomething." During that time, in 1991, People Magazine named him one of the "50 Most Beautiful People". He left the series in 1991 to pursue an interest in directing. As an actor, Horton appeared in a number of television shows including St. Elsewhere, The White Shadow, Dallas, and Eight Is Enough. He also appeared in the 1997 TV movie version of the Jon Krakauer book Into Thin Air, playing Scott Fischer, the leader of the disastrous 1996 climb on Mount Everest. As a director, he has worked on a number of television series including "thirtysomething," "The Wonder Years," "Once and Again," and "Grey's Anatomy."

Doug Korthof: EV driver



A staid computer programmer, Doug Korthof was drawn to electric cars and environmental concerns by accident. Korthof attended Cal State University, Long Beach (CSULB), where he received a B.A. in Mathematics in 1968 and an M.A. in Philosophy in 1970. From 1978 until 1980 Korthof ran a metal recycling business in Long Beach, California. From there he was a part-time lecturer in computer science at CSULB and a mainframe computer programmer at Northrop, SCE, Farmers Insurance, Blue Cross, Sempra, SunAmerica, Rockwell, and the UCLA Medical Center.

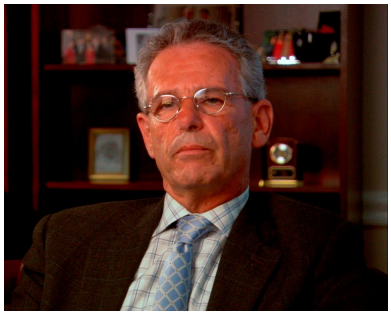
Although reluctant to give up gasoline cars and skeptical of electric vehicles, his son convinced Korthof to pursue leasing an EV. Since then he has spent his life fighting to be able to drive an electric vehicle. From 1997 to the present he has worked on internet campaigns and ran websites that include Saving Hellman Wetlands in Seal Beach (http://www.SealBeach.org), Saving Los Cerritos Wetlands (still under contention), Saving Little Shell Wetland in Huntington Beach (won), Improving Sewage Treatment (http://www.StopTheWaiver.com won), Saving Ballona Wetlands in Los Angeles, Saving Los Angeles Native American sacred sites (http://www.Tongva.com), Losing fight to save Orange County Juaneno sacred village (http://www.Putiidhem.org), Promoting Electric cars (http://HondaEV.org http://EV1.org http://DrivingTheFuture.com http://NoGaso.com and Yahoo group http://autos.groups.yahoo.com/group/electric_vehicles_for_sale/).

Alan C. Lloyd Ph.D: Chairman of California Air Resources Board 1999-2004

Alan C. Lloyd, Ph.D. was appointed as the Secretary of the California Environmental Protection Agency (Cal/EPA) by Governor Arnold Schwarzenegger in December 2004. As Secretary of Cal/EPA, Dr. Lloyd oversees the environmental activities of the Air Resources Board, Integrated Waste Management Board, Water Resources Control Board, Office of Environmental Health Hazardous Assessment, Department of Toxic Substances Control and the Department of Pesticide Regulations. Cal/EPA is home to approximately 4,500 employees.

Dr. Lloyd most recently served as the Chairman of the California Air Resources Board, appointed by Governor Gray Davis in February 1999 and reappointed by Governor Arnold Schwarzenegger in August 2004. Previously, Dr. Lloyd served as the Executive Director of the Energy and Environmental Engineering Center for the Desert Research Institute at the University and Community College System of Nevada, Reno. From 1988 to 1996, Dr. Lloyd was the chief scientist at the South Coast Air Quality Management District, where he managed the Technology Advancement office that funded public-private partnerships to stimulate advanced technologies and cleaner fuels. In 2003, Dr. Lloyd was Chairman of the California Fuel Cell Partnership and is a co-founder of the California Stationary Fuel Cell collaborative. He is a past chairman of the U.S. Department of Energy Hydrogen Technical Advisory Panel (HTAP). Dr. Lloyd, 63, earned both his Bachelor of Science in Chemistry and Ph.D. in Gas Kinetics at the University College of Wales, Aberystwyth, U.K.

Alan Lowenthal: California State Senator, Long Beach, District 27



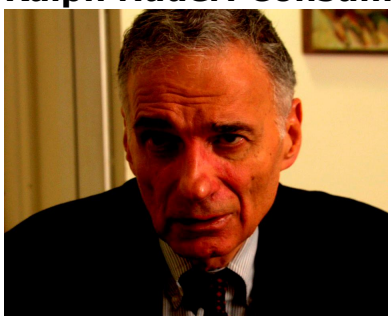
Alan Lowenthal was elected to represent the 27th District of the California State Senate in November of 2004 following six years in the California State Assembly. Senator Lowenthal is strongly committed to ensuring that the interests of the 27th Senate District are represented in Sacramento, including education, public safety, economic development and environmental protection. Senator Lowenthal serves as Chair of the Senate Committee on Transportation and Housing as well as the Senate Select Committee on California Ports and Goods Movement.

A resident of Long Beach, Senator Lowenthal is married to Dr. Debbie Malumed, a family practice physician. He has two adult sons, Joshua and Daniel (married to Suja) and one grandson, Avinash. He graduated with a B.A. from Hobart College and earned a Ph.D. from Ohio State University. Prior to his election to the Senate, Lowenthal served six years in the State Assembly and six years on the Long Beach City Council. A professor of community psychology, Lowenthal is on leave from California State University, Long Beach, where he has taught since 1969.

Edward H. Murphy, Ph.D.: American Petroleum Institute

Edward H. Murphy is the downstream manager of the American Petroleum Institute. API is a trade association representing 400 companies involved in all aspects of the U.S. oil and natural gas industry. His responsibilities include oversight of issues important to the refining and marketing sectors of the industry.

Ralph Nader: Consumer advocate



Ralph Nader is a consumer advocate, lawyer, and author. He was born in Winsted, Connecticut on February 27, 1934. In 1955 Ralph Nader received an AB magna cum laude from Princeton University, and in 1958 he received a LLB with distinction from Harvard University. His career began as a lawyer in Hartford, Connecticut in 1959 and from 1961-63 he lectured on history and government at the University of Hartford.

In 1965-66 he received the Nieman Fellows award and was named one of ten Outstanding Young Men of Year by the U.S. Junior Chamber of Commerce in 1967. Between 1967-68 he returned to Princeton as a lecturer, and he continues to speak at colleges and universities across the United States. In his career as consumer advocate he founded many organizations including the Center for Study of Responsive Law, the Public Interest Research Group (PIRG), the Center for Auto Safety, Public Citizen, Clean Water Action Project, the Disability Rights Center, the Pension Rights Center, the Project for Corporate Responsibility and The Multinational Monitor(a monthly magazine).

Dan Neil: Auto Critic, Los Angeles Times

Dan Neil is an automobile columnist for the Los Angeles Times, noted for his one-of-a-kind reviews of automobiles, which blend technical expertise with offbeat humor and astute cultural observations. Neil was born in New Bern, North Carolina and received a B.A. degree in Creative Writing from East Carolina University and an M.A. degree in English Literature from North Carolina State University. He began his professional writing career with the Spectator, a local free weekly, and began working for The News & Observer of Raleigh, North Carolina as a copy editor in 1989.
In 1991 he began editing and writing the paper's weekly automotive section.

Neil next enjoyed a varied career as a free-lance journalist, including contributing occasional automotive reviews to the New York Times. In early 2003 he took on a role of full-time columnist for the Los Angeles Times and quickly gained a following for his unique approach to automotive writing, which routinely incorporated criticism of Detroit automakers and U.S. government policies regarding emissions and safety regulation. Neil was awarded the Pulitzer Prize for these columns in 2004. Neil has

indicated that, in the wake of his winning the award, he will continue writing for the Times, begin work on a non-fiction book, and possibly host an automotive-themed television show.

Linda Nicholes: EV driver

Linda Nicholes was born in Boise and spent much of her childhood on horseback in the beautiful Idaho countryside. Her life-long love of nature and unspoiled, open space grew from adventures on her grandparents' ranch. Her environmental and renewable energy activism were inspired, in part, by her Grandfather's reverence for the natural world. Linda graduated from the University of Oregon in 1968 and Court Reporting School in 1974. She worked as a Certified Superior Court Reporter in Monterey and Orange County Superior Courts for nearly 30 years. Upon retiring from Court Reporting, Linda became involved in various environmental causes including preservation of the Orange County Bolsa Chica Wetlands. She also worked with the Ocean Outfall Group to successfully convince the Orange County Sanitation District to drop their long-time Waiver to the 1972 Clean Water Act. She joined in the equally successful effort to ensure that some Southern California Beaches are now smoke-free zones.

Linda's most passionate activism, however, centers on the promotion of renewable energy and the ways in which alternative fuels can be applied to the transportation sector. Linda became one of the first residential solar photo voltaic installers in the City of Anaheim and successfully lobbied Anaheim to offer solar installation incentives to its citizens. Excited by the fact that her home was "solely powered by solar" she and her husband Howard Stein purchased their first RAV4 electric vehicle in 2001 and installed more residential panels so that both the car and their home could be fueled by the sun. Linda then became a cofounder of Dontcrush.com, the grassroots organization which successfully halted the crushing of hundreds of Ford Rangers and Toyota RAV4s Electric Vehicles. Dontcrush morphed into Plug in America, an organization that advocates the use of plug-in cars, trucks and SUVs powered by cleaner, cheaper, domestic electricity to reduce our nation's dependence on petroleum and improve the global environment.

Iris and Stanford Ovshinsky: Founders of Energy Conversion Devices and Ovonic Battery Company and inventors of Nickel Metal Hydride (NiMH) batteries that powered second-generation EV1 from 1999. Their battery technology powers many of today's hybrid cars.

Stanford Ovshinsky, President & Chief Scientist and Technologist

Stan Ovshinsky pioneered the fundamentally new science of amorphous and disordered materials. In 1960, Stan established ECD Ovonics to use science and technology based on his game-changing discoveries to solve basic societal problems by building new industries and offering innovative solutions. Forty-plus years later, Stan's original vision is reality. New industries, including optical media and digital memory, and the hydrogen economy, have been bolstered as a result of Stan's inventions. Because of Stan's pioneering

inventions, innovation, and vision, these industries and economies will continue to develop, grow, and change the world through the Ovonic Solutions.

Iris Ovshinsky, Vice President, Special Projects
Iris Ovshinsky, co-founder of ECD Ovonics with her husband, has degrees in zoology, biology, and a doctorate in biochemistry. Working as a team, the Ovshinskys pioneered breakthroughs in four major areas: energy generation, energy storage, information systems, and atomically engineered synthetic materials. They have been honored with the American Chemical Society's Heroes of Chemistry 2000 Award.

Alexandra Paul: EV driver

Internationally recognized for her five-year starring role as Lt. Stephanie Holden in the hit series BAYWATCH, Alexandra Paul began her acting career at age eighteen. She can be seen in over sixty films and television movies and continues to work as an actress, starring in six movies in the last year.

When the Exxon Valdez spilled millions of gallons of oil into the ocean, Alexandra was horrified, but further contemplation made her realize that *she* was part of the problem too. So Alexandra bought her first EV in 1990 (a converted VW Rabbit that got 25 miles per charge) and has since owned four more electric cars, her favorite being the EV1, which took her 120 miles per charge. She currently drives a Toyota RAV 4 EV. With that EV, as seen in the documentary, Alexandra and Colette Divine blockaded a transport truck, in an attempt to save the last EV1s from the crusher. Twenty Burbank policemen took two hours to end the peaceful standoff, and Alexandra and Colette were arrested. They were fined and given eighty hours of community service by a judge who, ironically, encouraged them to volunteer for environmental and electric car non-profits! Alexandra is a founding member of Plug in America. For more information on Alexandra, go to:www.alexandrapaul.

Bill Reinert: National Manager of Advanced Technologies, Toyota Motor Corp. USA

Bill Reinert is the national manager in charge of the Advanced Technology Group for Toyota Motor Sales, U.S.A., Inc. He is responsible for the long-range product planning for all alternative fueled Toyota vehicles. Currently, Bill is working on several advanced hybrid electric products, fuel cell vehicles using both direct hydrogen and reformed fuel approaches, full featured electric vehicles, city electric vehicles and sustainable transportation systems. Prior to his current assignment, Bill was project director for Project Perseus, a Toyota initiative to investigate markets for distributed power devices including micro-turbines and stationary fuel cells. Before joining Toyota, Bill spent several years developing advanced neural network applications and advanced energy systems for Hewlett Packard. In addition, Bill developed alternative energy solutions for Bell Labs. Bill has a master's degree in energy engineering from the University of Colorado, Boulder and did his undergraduate work in biopsychology with the University of Missouri at Kansas City.

Wally E. Rippel: Research Engineer, AeroVironment (EV1 R&D

team)

Wally Rippel has been the Principal Power Electronics Engineer at AeroVironment (R&D) since 1992, where he has invented a variety of things including an integrated charger-inverter for electric and hybrid applications, and designed an advanced hub motor for electric vehicles. Rippel has a B.S. in Physics from Caltech and a M.S. in Electrical Engineering from Cornell University. Previously he has worked as a part time consultant for AeroVironment, where he helped write the proposal for the Impact EV project as well as worked on the development of the Impact's induction motor and power electronics after AeroVironment received a contract from GM. Rippel has been published over twenty times and holds twenty three US patents. He has received thirteen New Technology Awards from NASA, as well as a Best Paper Award from Intertech Publishing.

Paul Roberts: Author, The End of Oil

A journalist since 1983, Paul Roberts writes and lectures frequently on the complex interplay of economics, technology, and the natural world. His first book, The End of Oil is a "geologic cautionary tale for a complacent world accustomed to reliable infusions of cheap energy." The book centers around one irrefutable fact: the global supply of oil is being depleted at an alarming rate. Precisely how much accessible (not to mention theoretical) oil remains is debatable, but even conservative estimates mark the peak of production in decades rather than centuries. Which energy sources will replace oil, who will control them, and how disruptive to the current world order the transition from one system to the next will be are just a few of the big questions that Paul Roberts attempts to answer in this timely book.

Roberts also writes for Harper's Magazine and The Los Angeles Times, and has appeared in The Washington Post, Slate, USA Today, The New Republic, Newsweek, Rolling Stone, and Outside magazine. He was a finalist for the National Magazine Award (1999) and for the New York Public Library Helen Bernstein Book Award for Excellence in Journalism in 2005. A long-time observer of energy issues and politics, Roberts appears regularly on national and international television and radio news shows, including CNN's Lou Dobbs, the BBC, PBS NewsHour, MSNBC, CBS Evening News, and on NPR's Morning Edition, On Point, Weekend Edition, and Fresh Air. He lives in Washington State.

Joseph J. Romm Ph.D: Author, The Hype About Hydrogen

Dr. Joseph Romm is one of the world's leading experts on advanced vehicles and greenhouse gas mitigation. He is coauthor of the Scientific American article, "Hybrid Vehicles Gain Traction" (April 2006) and author of the report, "The Car and Fuel of the Future," for the National Commission on Energy Policy (July 2004). He wrote The Hype About Hydrogen: Fact and Fiction in the Race to Save the Climate,

named one of the best science and technology books of 2004 by Library Journal. Dr. Romm served as Acting Assistant Secretary at the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy during 1997 and Principal Deputy Assistant Secretary from 1995 though 1998. In that capacity, he helped manage the largest program in the world for working with businesses to develop and use advanced transportation and clean energy technologies-one billion dollars aimed at hybrid vehicles, electric batteries, hydrogen and fuel cell technologies, renewable energy, distributed generation, energy efficiency, and biofuels.

Dr. Romm is executive director of the Center for Energy and Climate Solutions-a one stop shop helping businesses and states adopt high-leverage strategies for saving energy and cutting pollution. He holds a Ph.D. in physics from M.I.T. He has written and lectured widely on advanced transportation technologies, clean energy, business, and environment issues, including articles in Technology Review, Issues in Science and Technology, Forbes, Foreign Affairs, The New York Times, the L.A. Times, Houston Chronicle, Washington Post, Science and Scientific American. He co-authored "MidEast Oil Forever," the cover story of the April 1996 issue of the Atlantic Monthly, which predicted higher oil prices within a decade and discussed alternative energy strategies.

Paul Scott: EV driver

PAUL SCOTT (EV Activist) began EVangelizing for Electric Vehicles shortly after taking possession of his RAV4 EV from Toyota in late 2002. Along with his wife, Zan Dubin Scott, he organized several EV events to pressure the California Air Resources Board (CARB) to maintain its Zero Emission Vehicle Mandate. Through his efforts hundreds of letters were written to CARB, local and national TV news coverage of the issue was expanded and interviews were conducted on NPR.

After the failure of CARB to stand up to the auto industry and Bush administration, and the evisceration of the ZEV Mandate, Scott helped form DontCrush.com to actively protest the wholesale destruction of the production EVs being taken back upon the end of the leases. After successful actions against Ford and Toyota which saved some 1,000 vehicles, Scott helped morph DontCrush.com into Plug In America to proactively lobby government and industry to offer plug in vehicles to the public.

Bob Sexton: Former EV1 Service Technician

A California native, Bob Sexton has spent 25 years on the technical side of the automotive industry, working for both foreign and domestic manufacturers. After helping Saturn launch itself as a brand, Bob found his niche- with his wife Chelsea, working as a technician on the EV1 program. Bob quickly became the go-to guy for electric vehicle drivers throughout California, and remains a technical resource for those trying to revitalize plug-in hybrids and electric vehicles.

Chelsea Sexton: EV1 Sales Specialist till

late 2001 layoff, EV activist

Chelsea Sexton is a Los Angeles area native who is quite literally driven by her passion. She entered the automotive industry at the age of 17 after buying her first Saturn, but found her first true home on the General Motors EV1 electric vehicle program. Focusing on building a market for alternate-fuel vehicles through partnerships with corporate and non-profit stakeholders, shaping public policy and incentives, developing marketing strategies, and working directly with the drivers themselves, Chelsea became well-known as an advocate for clean, efficient, fun transportation. Such advocacy became a family passion when Chelsea married Bob Sexton, an EV1 technician, and had their son Christopher, who is now 7 years old and still designates the EV1 as the first car he remembers and the one he loves most.

When General Motors ended the EV1 program in 2001, Chelsea left the company and went on to make meaningful contributions in other areas. Still, cars, technology and the environment remains so much a part of her DNA that she continued to consult with auto manufacturers and clean energy providers regarding the needs and challenges of bringing alternate fuel vehicles to market, as well as increasingly clean ways to power them. In 2005, Chelsea joined the X PRIZE Foundation and led the creation of its next prize effort, which will deal with both energy and automobiles. She now manages an alternative fuel division for the Santa Monica based start-up Zag.com. In her spare time, Chelsea has helped to organize several grassroots campaigns to stop the destruction of various electric vehicles, and is the Executive Director of Plug In America, a coalition of individuals and organizations that advocates for the preservation and manufacture of electric vehicles and plug-in hybrids.

Jananne Sharpless: Chairwoman (1985-93), California Air Resources Board

Ms. Sharpless currently provides services as a consultant and serves on several nonprofit organizations and government advisory boards dealing with energy, air quality and transportation. In April 2002, she was elected as a Non-Affiliated Board member to the Western Electricity Coordinating Council. Between 1994 and 1999 Ms. Sharpless served as a Commissioner of the California Energy Commission. She was key in establishing policies and designing a program intended to support, build and sustain a competitive renewable energy industry in California's evolving electricity market. From 1985 to 1991 Ms. Sharpless was both Secretary of Environmental Affairs (the predecessor to the California Environmental Protection Agency-a Cabinet level position) and Chairwoman of the California Air Resources Board (CARB). In 1991 when the positions were separated and Cal-EPA was created, she continued to serve as the CARB Chair from January 1991 to November 1993. From April 1983 to May 1985 she was Deputy Secretary of the Environmental Affairs Agency.

Earlier in her career, she was a committee consultant in the California Legislature and an Administrative Assistant to the late John G. Veneman, R-Modesto. She has served on the U.S. Department of Energy Advisory Board, the U.S. Environmental Protection Agency's Clean Air Act Advisory Committee, the Department of Interior's Outer Continental Shelf Advisory Board, the Federal Fleet Conversion Task Force,

former Chair and member of the Advisory Board for the Institute of Transportation Studies, University of California, Davis, member of the Advisory Board to the College of Engineering Center for Environmental Research and Technology, University of California, Riverside, Past President of the American Lung Association, Sacramento-Emigrant Trails Chapter, and Chair of the Breath California Health Effects Task Force, former board member of the California League of Conservation Voters. Ms. Sharpless graduated from the University of California, Davis with a B.A. in Political Science.

J. Karen Thomas: EV driver

J.Karen Thomas is a gifted Actress, Dancer, Singer/Songwriter, and Voice Over Artist, who works constantly in film, television, stage and radio. She is grateful to have acted alongside; Jamie Foxx, Sissy Spacek, Ossie Davis, Courtney Cox, Jane Lynch and Ellen Degeneres. On television, J.Karen has had recurring roles on "Alley McBeal," "City of Angels" and "Melrose Place." She recently guest starred on the new CBS hit drama "Criminal Minds," and NBC's "Crossing Jordan." She can also be seen in the films "Gift for the Living," and "Sarang Song." Both films air on cable's Showtime (sho.com) as part of their Black Filmmaker's Showcase. J.Karen became active in the alternative fuel vehicle movement when she purchased a Toyota RAV4 EV in 2004. J.Karen is also committed to being of service to communities who promote education and diversity, volunteering for BookPALS (bookpals.net), Outfest, L.A. (outfest.org), and POWER UP (power-up.net).

Currently you can see J.Karen in "Prom-troversy," which airs frequently on the cable station; Logo. And, due out in theatres 2007, J.Karen Thomas once again lights up the silver screen in POWER UP's first feature film, "Itty Bitty Titty Committee," directed by Jamie Babbit ("But I'm A Cheerleader"). Finally, in June/July 2006, J.Karen and Colette are combining their star-power to launch Eco RockStar! (ecorockstar.com), a line of hip, comfy, socially and environmentally conscious t-shirts.

John R. Wallace: Former Director, Ford Th!nk EV program

John R. Wallace is an internationally known consultant for the fuel cell and hybrid electric drive industry, after recently retiring from the Ford Motor Company. Since November of 2005 he has been the CEO of Xantrex Technology, Inc. in Burnaby Vancouver. Prior to this position he was interim CEO for Avestor, a lithium metal polymer battery company located in Montreal. Mr. Wallace currently serves as a director on the boards of Xantrex, Millennium Cell, and Enova Systems as well as the Electric Drive Transportation Association. Some of his past clients included the Ministry of Science and Technology of China, the California Fuel Cell Partnership, and LG Chem. Prior to his retirement he was executive director of TH!NK Group. He has been active in Ford Motor Company's alternative fuel vehicle programs since 1990, serving first as: Director, Technology Development Programs; then as Director, Electric Vehicle Programs; Director, Alternative Fuel Vehicles and finally Director, Environmental

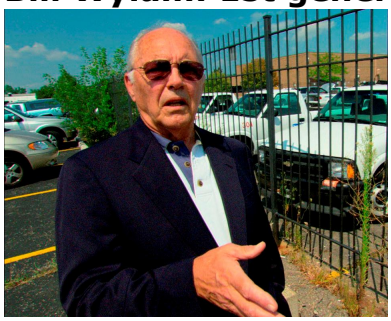
Vehicles.

Mr. Wallace also has been active in many outside organizations: He is past Chairman of the Board of Directors of TH!NK Nordic; he is past chairman of the United States Advanced Battery Consortium; Co-Chairman of the Electric Vehicle Association of the Americas, and past Chairman of the California Fuel Cell Partnership. He served as Director of Ford's Electronic Systems Research Laboratory, Research Staff, from 1988 through 1990. Prior to joining Ford Research Staff, he was president of Ford Microelectronics, Inc., in Colorado Springs. His other experience includes work as program manager with Intel Corporation. He also served as Director, Western Development Center, Perkin-Elmer Corporation; and President, Precision Microdesign, Inc. Wallace graduated from Rice University, Houston, Texas, in 1969 with a bachelor's degree in Electrical Engineering and earned his M.S. in Computer Science in 1970. He is married and has three children. The family lives in Rancho Santa Fe, California

R. James Woolsey: CIA Director (1993-95), Clinton Administration

Before he joined Booz Allen as a partner in July 2002, R. James Woolsey was an attorney with Shea & Gardner in Washington D.C., specializing in commercial litigation and alternative dispute resolution (arbitration and mediation). He practiced at the firm for 22 years on four different occasions and served five times in the federal government for a total of 12 years, holding Presidential appointments in two Democratic and two Republican administrations. He served as Director of Central Intelligence (1993-95), Ambassador and Chief Negotiator for the Conventional Armed Forces in Europe (CFE) Treaty in Vienna (1989-91), Delegate at Large (on a part-time basis) to the Strategic Arms Reductions Talks (START) and the Defense and Space Talks in Geneva (1983-86), Under Secretary of the Navy (1977-79), and General Counsel to the U.S. Senate committee on Armed Services (1970-73). He has served on numerous corporate and non-profit boards. From time to time he speaks publicly and contributes articles to newspapers and other periodicals on such issues as national security, energy, foreign affairs and intelligence.

Bill Wylam: 1st generation EV1 battery & motor engineer



Mr. Wylam has a degree in Materials Science Engineering from Purdue University and formerly was Chief Engineer-Batteries, Director of International Manufacturing, and Director of Technology Development for the Delco Remy Division of General Motors Corporation. He led the development of many electric and hybrid-electric powertrain systems including the motor and battery system for the GM EV1 electric vehicle. These systems included advanced motor-generators, power electronics and energy storage systems. Since 1998 he has been a technology executive with Delco Remy International (now Remy International) as Corporate Director-Technology until his retirement in 2005.

Mr. Wylam is also President of International Energy, LLC and the Chairman of Electricore, Inc., an Indiana-based not-for-profit corporation which organizes public-private partnerships to conduct research and development projects in the area of advanced technology. Since being founded in 1992, Electricore has managed projects totaling over $150 million. He is also a director of the Flagship Enterprise Center, a new Certified Technology Park in Anderson, Indiana, and a member of the Dean's Industry Advisory Council of the Purdue School of Engineering and Technology at IUPUI.

Timeline

The following are among the events documented in WHO KILLED THE ELECTRIC CAR?

1979
President Jimmy Carter resolves that the U.S. will never use more foreign oil than it imported in 1977.

1977 total U.S. oil imports (crude & refined): 8.8 million barrels/day
2005 total U.S. oil imports (crude & refined): 13.5 million barrels/day

1987
GM's one-of-a-kind solar powered electric "Sunraycer" wins the World Solar Challenge Race in Australia.

1988
September 1988: GM CEO (1981-1990) Roger Smith agrees to fund a prototype for a practical consumer electric car, engineered by the Sunraycer design team, AeroVironment.

1990
The Los Angeles basin (which includes LA, Orange, Riverside and San Bernardino counties) issues 41 stage-one smog alerts (a stage-one alert is called when ozone, one of the most health-damaging components of smog, exceeds .20 parts per million.)

January 1990: The GM Impact (re-named the EV1 before commercial release in 1996) is introduced as a concept car at the Los Angeles Auto Show.

September 1990: The California Air Resources Board (CARB) adopts the Zero Emission Vehicle (ZEV) mandate, requiring that automakers' California market share include 2% ZEVs in 1998, 5% ZEVs in 2001, and 10% ZEVs in 2003.

1995
March 1995: The American Automobile Manufacturing Association circulates a confidential proposal to launch a public relations "grassroots education campaign" to repeal the CARB ZEV program.

1996
March 1996: In response to auto industry pressure, CARB makes the ZEV mandate more flexible. A "Memorandum of Agreement" between

CARB and seven of the largest automakers states, in part, that the automakers will "promote and market ZEVs (zero-emission vehicles)" and build them in a "production capacity sufficient to meet market demand in California." The compromise frees automakers from meeting the 2% ZEV quota in 1998 but still requires that 10% of all new cars and light duty trucks in California be zero-emission, beginning in 2003.

December 1996: The GM EV1 production electric vehicle is made available for consumer lease at $400 - 500 a month.

1999
December 1999: GM finalizes its purchase of the Hummer-brand name from AM General Corporation.

2000
January 2000: Despite GM's claim that it was still committed to its electrical vehicle program, vice-chairman Harry Pearce says that "there is no particular need" to continue building electric vehicles. It also begins, in the coming months, to shift production from the EV1 to gasoline powered cars at its plant in Lansing, Michigan.

2001
October 2001: GM begins to lay off its EV1 sales team, starting with its most successful sales specialists.

2002
January 2002: GM, DaimlerChrysler, and seven San Joaquin Valley auto dealerships sue CARB in the U.S. District Court in Fresno to repeal the ZEV mandate.

October 2002: The U.S. Department of Justice files a "friend of the court brief" in support of GM and DaimlerChrysler's lawsuit against CARB, arguing that its ZEV mandate amounts to an attempt to regulate fuel economy standards, which only the federal government can do.

December 2002: Alan C. Lloyd, Ph.D., Chairman of the California Air Resources Board, is named the 2003 Chairman of the California Fuel Cell Partnership, an organization comprised of public agencies and private companies that promotes fuel cell vehicle technology and infrastructure growth.

2003

January 2003: President George W. Bush calls for research and development of hydrogen fuel cell vehicle technology in his State of the Union Address.

January 2003: Toyota announces that it would stop production on the RAV4 EV, citing poor sales. The RAV4 EV was the only commercial electric vehicle made by a major automaker that could be purchased ($42,000), in addition to being leased monthly.

April 2003: The California Air Resources Board, chaired by Alan C. Lloyd, Ph.D, modifies further the ZEV mandate, effectively dooming the electric car. Under the new revision, auto makers no longer have to make electric cars but instead are required to roll out a mix of fuel cell vehicles, gas-electric hybrids and PZEVs (partially zero emission vehicles) beginning in 2008. Dr. Lloyd had recently become Chairman of the California Fuel Cell Partnership promoting development of hydrogen fuel cell vehicles.

April 2003: Citing that it can no longer provide parts to repair the vehicles, GM announces that it will not renew EV1 leases. It intends to reclaim the vehicles by end of 2004 and tow trucks are dispatched to impound vehicles from customers unwilling to return their EV1s.

July 2003: Mock funeral for the EV1 is held in Los Angeles to draw press attention to GM pulling the EV1 off the road.

Ford, Honda, and Toyota also pull their fleets of leased electric vehicles off the road.

2004

December 2004: Following a tip that EV1s are being trucked to GM's Arizona proving grounds, Chris Paine (Director of WHO KILLED THE ELECTRIC CAR?) rents a helicopter. Scouting the vast proving ground, he spots and films piles of crushed EV1s.

2005

February 2005: The "Don't Crush" Campaign is launched. EV activists launch a 24-hour-a-day vigil at the GM Burbank facility to protest and monitor the fate of 78 impounded EV1s that are discovered in a lot behind a GM facility in Burbank, CA. Activists offer GM $1.9 Million to return the impounded fleet to willing buyers.

March 2005: EV activists learn that GM is loading EV1s held in the Burbank lot onto car-carrier trucks. Protestors block driveways and some are arrested by Burbank PD.

March 2005: In an interview with the filmmakers of "Who Killed the Electric Car?" GM spokesman Dave Barthmuss states that every part of the EV1s are being recycled, not simply crushed.

2006

March, 2006: Toyota and GM, the world's two largest automakers, end joint research on hydrogen-powered fuel cells because they could not agree on sharing intellectual property rights from their hydrogen fuel cell research.

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.

Fact Sheet

The following are among the facts and discussions referenced in WHO KILLED THE ELECTRIC CAR?

1. CO_2 emissions

Every gallon of gasoline burned in a gas-engine automobile adds on average 19 lbs. of CO_2 to the atmosphere.

- Jim Kliesch, a research associate and author of "The Environmental Guide to Cars and Trucks"; also Dr. Janet Hopson, researcher with Oak Ridge National Lab in Tennessee, quoted in "WHEN STUCK IN TRAFFIC, TRY NOT TO THINK OF CARBON DIOXIDE", Miami Herald, 4/11/05
- "Liquefying one kg of hydrogen using electricity from the U.S. grid would by itself release some 18 to 21 pounds of carbon dioxide into the atmosphere, roughly equal to the carbon dioxide emitted by burning one gallon of gasoline", Dr. Joseph Romm, from Congressional Testimony - House Science Meeting, 3/3/04)

2. **Combined Profits of Exxon-Mobil, Chevron-Texaco, and Conoco-Phillips**

2003: $33 Billion
2004: $47 Billion
2005: $64 Billion

- Exxon Mobil, racked up $ 21.5 billion in profits for 2003… ConocoPhilllips, which made $ 4.7 billion during the year. ("EXPLORATION AND PRODUCTION; In times

of plenty, they don't flash cash; Energy giants plan no burst of drilling", Nelson Antosh, Houston Chronicle, 2/5/04)

- "Exxon Mobil earned a profit of $25.33 billion last year, 17.8 percent better than in 2003…Chevron Texaco earned a profit of $13.328 billion in 2004 to end in sixth place in the Fortune 500 list." ("Consumers continue pushing oil companies' profits higher", Rockford Register Star, 5/15/05)
- "ConocoPhillips donated $3 million (after an $8 billion profit in 2004)… Exxon Mobil isn't the only oil company to give money to Katrina relief. The second-largest oil company, Chevron, donated $5 million (after a $13.33 billion profit in 2004)" ("Oil companies could pump up charity" by Jimmy Greenfield, Chicago Tribune, 9/9/05)
- "ConocoPhillips (USA), oil concern, nearly doubled its profit to USD 8.13 bil in 2004" (" ConocoPhillips nearly doubled its profits in 2004", Access Czech Republic Business Bulletin, 1/24/05)
- "Exxon's profit for the year was the largest annual reported net income in U.S. history, according to Howard Silverblatt, a senior index analyst for Standard & Poor's. He said the previous high was Exxon's $25.3-billion profit in 2004. The third best performance belongs to Citigroup Inc., which posted net income of $24.64-billion in 2005…. Its $36.13-billion profit is bigger than the economies of 125 of the 184 countries ranked by the World Bank." ("Exxon's record profits: $36.13B", St. Petersburg Times, 1/31/06)
- "Exxon Mobil has announced eye-popping record profits fueled by record gas and oil prices. Fourth quarter profits total $10.7 billion. Income for the year: More than 36 billion. It's the highest annual profit ever reported by a US company" ("Exxon Mobil reports $10.7 billion fourth quarter earnings", Susan McGinnis, CBS Morning News, 1/31/06)
- "Chevron's profit of $14.1 billion for the full year also was a company record. It has posted record annual profits in each of the past two years, earning a combined $27.4 billion." ("Chevron's profit at record $14.1 billion", Michael Liedtke, AP, 1/28/06)
- "Chevron Corp. yesterday reported the highest quarterly and annual profits in its 126-year history. Fourth-quarter earnings rose 20% to $4.14 billion US,

the most it has made in any three-month period since its inception in 1879. Chevron's profit of $14.1 billion US for the full year was also a company record." ("RECORD CHEVRON PROFITS", Toronto Sun, 1/28/06)

- "ConocoPhillips's record profit of $13.5 billion for all of 2005 capped a year in which oil producers and refiners were the top performers in the Standard & Poor's 500 index" ("Net soars at U.S. oil companies; Conoco and Hess rise more than 50% onsurge in energy price", Jim Kennett & Joe Carroll, International Herald Tribune, 1/26/06)
- "ConocoPhillips, the third largest oil and gas group in the US, yesterday reported a 51 per cent rise in fourth-quarter profit, cashing in on the high commodity prices that have rankled with a public struggling to cope with ever-growing fuel bills… For the full 2005 year, it reported net income of Dollars 13.5bn, or Dollars 9.55 a share, up from Dollars 8.1bn, or Dollars 5.80 a share, a year earlier. Total revenue was Dollars 183.4bn, up from Dollars 136.9bn." ("Conoco cashes in with 51% rise in profits", Sheila McNulty, Financial Times, 1/26/06)

3. **Coal Usage in America**
   According to the Energy Information Administration, the "Electric Power Generation By Fuel Type" states that coal accounted for 50% of the electric power generation in '04.

4. **Average Hybrid Fuel Economy (City and Hwy)**
   Japanese Hybrid Vehicles (2000-2006): 42 mpg
   American Hybrid Vehicles (2000-2004): 25 mpg

5. **Federal Tax Credits for Vehicles**
   2002: Maximum federal tax credit for electric vehicle: $4,000
   2003: Maximum federal tax credit for vehicle weighing 6,000 lbs and greater: $100,000

6. **Bush Administration Links to Oil and Auto Industries**
   - Vice-President Dick Cheney: former CEO of Halliburton Co. (1995-2000)
   - Secretary of State Condoleeza Rice: Member, Board of Directors, Chevron Corp. (1991-2001)
   - White House Chief of Staff (resigned March 28, 2006) Andrew H. Card Jr.: GM VP of Government Affairs (chief

lobbyist) (1999-2001), President and CEO of the American Automobile Manufacturers Association (1993-1998)

- Former Energy Secretary Spencer Abraham (resigned November 14, 2004) Before his stint as Energy Secretary, Spencer Abraham served briefly in the U.S. Senate, where he twice co-authored bills to open the Arctic National Wildlife Refuge for drilling and opposed raising corporate average fuel economy (CAFE) standards.

7. **Arctic National Wildlife Refuge**

   It is estimated that oil extracted from the Arctic National Wildlife Refuge (ANWR) could meet US energy demands for roughly one year. Oil isn't expected to start flowing from ANWR until at least 2015, with peak production commencing around 2025. According to the National Resources Defense Council, raising mileage standards in American autos to 40 MPG (currently feasible with no major technology advances) in the next decade would save 76 billion barrels of oil by 2065—11 times the output of ANWR.

8. **"Long Tailpipe" Controversy Studied**

   The "long tailpipe" theory argues that electric vehicles do not reallycreate zero emissions, because the electricity needed to charge the batteries is produced in power plants. In June 2001, the Argonne National Laboratory released a US Department of Energy-sponsored study that found that battery-powered electric vehicles result in a 35% reduction in greenhouse gases. This reduction was based upon electricity generation from the national grid, roughly half of which is derived from coal (According to the Energy Information Administration, the "Electric Power Generation By Fuel Type" states that coal accounted for 50% of the electric power generation in '04).

   In 2004, an analysis of data from the California Air Resources Board found that electric vehicles resulted in a 67% reduction in overall greenhouse gases in California, compared to a car powered exclusively by gasoline. Also in 2004, the Institute for Lifecycle Environmental Assessment compared battery electric vehicles to vehicles using hydrogen fuel cells, and found that the former technology was almost twice as efficient in its use of energy than current fuel cell technology. Electric vehicles also reduced nearly twice as much greenhouse gas emission than hydrogen fuel cell vehicles.

Finally, some energy experts and utility analysts contend that millions of plug-in hybrid electric vehicles could be added to California's fleet without substantially impacting the state's current energy grid, since most of the charging for the plug-in hybrid electric vehicles could be done during off-peak hours, at night.

2004 CARB reference: information derived from CARB staff report – "Regulations to control greenhouse gas emissions from motor vehicles" (8/6/04) Argonne National Lab. Reference: "Development and Use of GREET 1.6 Fuel-Cycle Model for Transportation Fuels and Vehicle Technologies", by MQ Wang, Center for Transportation Research, Argonne National Laboratory, June 2001
"Carrying the Energy Future: comparing electricity and hydrogen for transmission, storage and transportation", Institute for Lifecycle Environmental Assessment, Patrick Mazza & Roel Hammerschlag, June 2004, p.25
phone conversation with Southern California Edison's Ed Kjaer, December, 2005

9. **Production Electric Vehicles Sold or Leased in U.S.**

General Motors EV1
Ford Ranger pickup
Ford Th!nk City
Ford Th!nk Neighbor
Honda EV Plus
Toyota RAV4 EV
Nissan Altra EV
GM Chevrolet S-10 compact pickup
Chrysler EPIC minivan

10. **Total Number of GM EV1s Leased 1996-2000:**

about 800

11. **Ratio of EV1 Waitlist Names to Committed Customers**

- According to GM, 4000 prospective EV1 customers on waitlists were contacted in 2001 about leasing an EV1, and only 50 were willing to sign a lease. EV1 supporters argue that GM discouraged prospects from signing up with the EV1 program.

- "Mr. Stewart acknowledged that more than 4,000 people had requested more information about the car. "Yet in 2001," he said, "when the company asked those people if

they would sign a lease for a car should one become available, less than 50 people wanted to go to the extent of actually leasing." ("Leased and Abandoned: Revolt of the EV-1 Lovers", Chris Dixon, New York Times, 10/22/03)

12. **5 Conditions Required for a Viable Hydrogen Fuel-Cell Vehicle** (as mentioned in the film by Joseph J. Romm, Ph.D., author, *The Hype about Hydrogen)* **:**

- Price. Hydrogen fuel-cell vehicle currently costs 1 million dollars.
- Range. Normal-size vehicle can't carry enough hydrogen (H2) fuel to provide needed range.
- Fuel. H2 fuel is very expensive and is currently produced using non-renewable fuel sources.
- Infrastructure. A national H2 fueling stations must be built at enormous expense before H2 cars are commercially viable.
- Competition. By the time the other miracles are overcome, competing technologies will have improved.

More Frustrating Facts

Presented in Who Killed the Electric Car?

1. According to the Bureau of Transportation Statistics, Americans drive an average of 29 miles a day, which means that most Americans could drive for several days without needing to charge an electric car.

a) Bureau of Transportation Statistics, 'National Household Travel Survey', 2001 – 2002;
See:http://www.bts.gov/programs/national_household_travel_survey/daily_travel.html

b) "According to the latest statistics from the U.S. Department of Transportation, Americans drive an average of 29 miles and spend some 55 minutes a day in their vehicles." ("5 tips: saving money – and gas", April 7, '04, Gerry Willis/CNN Money Contributing Columnist)

c) email confirmation from David Smallen, Dir. of Public Affairs, Bureau of Transportation Statistics, on 3/31

2. Battery electric cars never need any gasoline. They can often get most of their power re-charging in the first 2 hours. Most people also charge them overnight, when electricity demand is off-peak and rates for the electricity are consequently lower.

a) Per email communication with Chelsea Sexton on 4/10/06: "True. Lead Acid cars charge about 80% in an hour. NiMH cars are more linear, taking 4-6 hours to charge fully, but still recoup a significant amount of power in the first couple of hours. The time depends on the charging rate and the size of the battery pack. If you wanted to cover your bases, you could say "often" getting most of their power in the first two hours."

b)email communication with Lisa Rosen, on 4/10: "Battery electric cars can provide superior transportation without gasoline or oil. They can get a significant charge in two hours using solar power or recharge fully overnight using otherwise underutilized generating capacity."

3. Japanese hybrids are nearly twice as fuel efficient, on average, as their American counterparts.

According to the EPA, the fuel economy of combined city and highway driving for Japanese hybrids, from model year 2000 to 2006, is 42mpg. For American hybrids, which were introduced only in 2004, the combined city and highway driving fuel economy is only 25 mpg. (EPA fuel economy ratings web site, http://www.fueleconomy.gov/feg/findacar.htm)

4. 2005 was the hottest recorded year in more than a century, as well as the year ExxonMobil boasts the largest ever annual reported net profit in U.S. history.

5. We've seen electric cars before: one hundred years ago there were MORE electric cars on the road than gas cars.

6. A gallon of gas burned by an internal combustion engine adds roughly 19 pounds of carbon dioxide to the air. The more gas you burn in your car, the more CO2 you create.

7. After the OPEC oil embargo in the 1970's, the US government created Corporate Average Fuel Economy, or CAFÉ Standards, to improve fuel economy in American vehicles. As a result, in less than ten years, fuel economy increased by more than fifty percent. Unfortunately two decades later, there has been virtually no change.

8. In 1990, the California Air Resources Board (CARB) adopted automobile emission standards that were tougher than the federal standards. The tough, new California regulations were highlighted with the state's Zero Emission Vehicle (ZEV) mandate, under which 10% of all new cars sold in California would have been electric 10% by 2003. Only electric cars were deemed to have no tailpipe emissions. Instead, most of the hundreds of electric vehicles that were manufactured were taken off the road and destroyed by carmakers.

a) "The new rules require carmakers to start selling cleaner vehicles starting in 1994 in the smoggy Los Angeles basin and 1997 statewide. By 2003, all cars sold in the state must emit at least 70 percent fewer hydrocarbons and other smog-forming chemicals than the 1993 models... The car companies wanted at least a one-year delay and the elimination of the rule that 2 percent of all cars sold produce zero emissions starting in 1998, rising to 10 percent by 2003. Electric cars are the only vehicles that can meet that standard." ("California Gets World's Toughest Auto Smog Rules; Lobbyists fail to stop requirement for electric", Vlae Kershner, SF Chronicle, 9/29/90)

b) "The plan would, between 1994 and 2003, require the use of cars that are 50 percent to 84 percent less polluting than those which meet the current strictest standards. The state agency would test the cars' emissions before licensing them. In the first year about 200,000 "ultra clean" cars would be required, about 10 percent of annual new car sales in California. By 2003, the regulation would cover all 2 million cars sold annually.The board also would mandate production of so-called zero-emission electric cars starting in 1998. Up to 200,000 electric cars could be in the state by the year 2003, the ARB contends.The board says the plan is expected to reduce emissions of hydrocarbons by 28 percent, or 185 tons per day; nitrogen oxide by 18 percent, or 248 tons per day; and carbon monoxide by 8 percent, or 3.17

tons per day." ("State Air Board Considers Sweeping Fuel-Vehicle Rules to Clean Air", by John Antczak, AP, 9/27/90)

c) "Last October attorneys from the Justice Department joined General Motors and Daimler-Chrysler in their lawsuit to overturn California's historic Zero Emission Vehicle (ZEV) mandate, requiring car manufacturers in the state to sell a certain number of zero-emission and "advanced technology" ZEVs, such as hybrid gas-electric cars. The carmakers argued that mandating hybrids--since they burn traditional fuel--amounted to a regulation of fuel economy." ("Activists battle Bush assault on California green laws. ; Rewriting the Rules: The Bush Administration's Assault on the Environment; Cover Story", Rich Heffern, National Catholic Reporter, 3/14/03)

d) "In a potential death knell for the electric car, California air officials on Thursday dropped landmark regulations dating back to 1990 that require automakers to make a specific number of electric cars...Instead, state regulators threw their lot in with a new technology, approving a revised program that forces car companies to build a quota of equally non-polluting fuel cell vehicles over the next decade.The air board made national news in 1990 when it required that 10 percent of new vehicles sold in California by 2003 -- roughly 100,000 cars -- be "zero-emission" or electric. As battery technology failed to deliver, however, the board slashed that requirement at least three times. By 2001, the board mandated that only 2 percent of new cars sold be electric by 2003. As ofThursday, there is no electric mandate."("ELECTRIC CAR RULES DROPPED;
STATE PANEL TURNS TO FUEL CELL VEHICLES", Paul Rogers, SJ Mercury News, 4/25/03)

e) "In addition, the guidelines require that 2 percent of all cars sold in the state have zero emissions by 1998, rising to 10 percent by 2003. That regulation will make electric cars an everyday reality. In a decision likely to have national implications, California adopted new air-quality standards Friday that mandate the development of "ultra-clean" cars and cleaner burning fuels. Friday, California adopted "technology-forcing" automobile emission rules stricter then the federal government's. The average hydrocarbon emissions of all vehicles will drop from 0.25 grams per mile in 1994 to o.062 in 2003. Emission requirements will be phased in as follows." ("California sets new air-quality standards", Jorge Casuso, Chicago Tribune, 9/29/90)

9. In March 1996, nearly nine months before GM made the EV1 electric car available for consumer lease, CARB had already weakened the ZEV mandate under pressure from the car and oil companies. The compromise freed automakers from meeting the 2% ZEV production quota in 1998, instead allowing them to build electric vehicles based on "market demand", but still required that 10% of all new cars and light duty trucks sold in California be zero-emission, beginning in 2003.

10. Changes to California's ZEV mandate in 2003 allowed carmakers to make as few as 250 demonstration hydrogen fuel cell vehicles by 2008, along with increased production of gas-

electric hybrids and cleaner gas-burning vehicles, instead of the estimated 100,000 to 200,000 new electric cars that were required under the original ZEV mandate by 2003.

a) But on April 24, CARB junked the 1990 mandate altogether, instead urging automakers to sell 125,000 gasoline-electric hybrid vehicles and ultra-clean gasoline-powered vehicles by 2010. There was hope that CARB would allow for even a few hundred more electric cars just to keep the technology alive, but the only nod to zero-emissions advocates like Korthof was CARB's recommendation that the auto industry continue work on hydrogen-powered fuel-cell cars. ("Dude, where's my electric car?!", Matt Coker, OC Weekly, 5/9/03)

b) And two days after Earth Day, the California Air Resources Board adopted new standards for zero-emission vehicles. Gone was the mandate for all-electric cars. In its place -- in addition to a lot of encouragement for gasoline-electric hybrids and other ultra low-emission vehicles -- was a target of 250 fuel cell vehicles on the road by 2008. ("WILL FUEL CELLS POWER OUR CARS OF THE FUTURE?; DRIVING THE GREEN DREAM", Phil Yost, SJ Mercury News, 4/27/03)

c) The revised regulation, which takes effect in 2005, calls for hundreds of thousands of cleaner gas-burning vehicles, tens of thousands of gas-electric hybrids and 250 hydrogen fuel cell vehicles in the next five years.CARB chairman Alan Lloyd said the board was relying on the industry to turn a new leaf and cooperate on meeting the regulation. He defended the changes and said the board was not retreating from the original zero-emission objective in the nation's smoggiest state. "It's not backsliding. We're getting vehicles out there in greater numbers that we anticipate being closer to zero," he said. "In fact, we're probably getting clean air faster." ("California Eases Emissions Regulations", CSNEWS.com, 4/25/03)

d) Under the air board's new rules, carmakers will be required to make 250 fuel cell vehicles by 2008; 2,500 by 2011; and 25,000 by 2014. Fuel cell vehicles are still largely on the drawing board. Prototypes cost roughly $1 million each to manufacture, Shosteck said. Fuel cell vehicles run on a complex chemical reaction, gaining energy from hydrogen or other clean sources. They emit only water vapor. The air board, whose members are appointed by the governor, also required that carmakers make 420,000 hybrid cars, such as the Toyota Prius and Honda Insight, which run on small gasoline engines and electric batteries, by 2011.And it required 3.4 million "partially zero emission vehicles" by 2010. Already about a dozen models of those super-clean gasoline cars, know as "PZEVs," are for sale in California, including the Toyota Camry, BMW 325 and Nissan Sentra. They emit 5 percent of the smog of a standard new gasoline-powered car. ("ELECTRIC CAR RULES DROPPED;
STATE PANEL TURNS TO FUEL CELL VEHICLES", Paul Rogers, SJ Mercury News, 4/25/03)

e) CARB's changes to the state's ZEV regulation allows manufacturers to choose a new alternative ZEV compliance strategy, meeting part of their ZEV requirement by collectively producing approximately 250 fuel-cell vehicles by 2008. The remainder of their ZEV requirements could be achieved by producing 4 percent advanced technology ZEVs and 6 percent partial ZEVs. The required number of fuel-cell vehicles will increase to 2,500 from 2009-11, 25,000 from 2012-14 and 50,000 from 2015 through 2017. Automakers can substitute battery-electric vehicles for up to 50 percent of their fuel cell

vehicle requirements. ("ENVIRONMENTALISTS SPLIT OVER CALIFORNIA DECISION TO DROP EV MANDATE", Inside Fuels & Vehicles, 5/8/03)

11. Maximum federal tax credit for an electric vehicle in 2002: $4,000.
Maximum federal tax credit for a 6000 + lb vehicle in 2003 : $100,000.

12. In the late 1990's, GM had at least a two-year jump on the world's carmakers with its electric car technology. But instead of capitalizing on this lead with hybrids and more electric vehicles, it abandoned its program.

Interview with former GM Board Member Tom Everhart, July 21, 2005: "I made the case at the General Motors Board that the reason for the EV1 was to give General Motors a very big head start in how you transform electricity into the drive power for the car. And that can be used [SOUNDS LIKE: with an] electric car, it can be used with a gasoline hybrid, a diesel hybrid, a fuel cell hybrid, any type of hybrid that you think of. …
[02:50:28]
And it seemed to me that was a really big advantage, and we give <u>them two, three years lead</u>. And in my judgment, it did. But my frustration was they did not capitalize on the lead. And the reason, which was discussed with the board, was that there was not a profit seen to be coming out of either electric cars, or hybrids, for a period of time. They could not understand how Toyota could possibly make a profit out of the Prius, for example

13. One month after buying Hummer from AM General, GM says there is "no particular need" to continue building EV1s.

14. GM took their EV1 cars off the road over protests of the people who leased them, refused $1.9 million to buy 78 of them, and then proceeded to destroy them over the pleas of the people who were trying to save them.

15. GM began laying off its most successful EV1 sales specialists in October, 2001, a few months before GM, DaimlerChrysler and seven California car dealers sued CARB to repeal the electric car mandate.

16. GM's former VP of Government Relations, Andrew Card, was also the CEO & President of the American Automobile Manufacturers Association (AAMA). During Card's tenure, the AAMA hired a PR firm to start a "grassroots" campaign to combat "growing acceptance of electric vehicles." A poll

released in May 1994, a year before the AAMA solicited offers by PR firms to develop a campaign against the electric car, showed 60% support for the ZEV mandate and that nearly 30% of those polled would be interested in buying an electric car if it was on sale for $20,000 to $30,000.

a) "A new poll, commissioned by environmental groups, concludes 8% of California's voters, or 1 million people, would "definitely" buy an electric car for between $ 20,000 and $ 30,000. The poll was conducted by Fairbank, Maslin, Maullin & Associates, a Santa Monica opinion research firm." ("Oil companies advance RFG against rising anti-oil feelings; reformulated gasoline", Mark Emond, National Petroleum News, June 1994)

b) "Supporters of alternative energy cars released a poll Friday showing 60 percent of Californians support a state mandate that requires the nation's leading automakers to produce 30,000 electric vehicles for sale beginning in 1998.The survey of 800 registered voters by the polling firm of Fairbank, Maslin, Maullin & Associates also found 28 percent of the respondents would be likely to buy an electric vehicle if it were available today for less than $30,000." ("Poll shows support for electric cars", UPI, 5/6/94)

17. Card became George W. Bush's Chief of Staff and during Bush's first term in office, the federal government joined the lawsuit that helped to kill the electric car mandate.

18. Although a better battery was available at the time, the EV1 debuted with a weaker battery that gave the car nearly half the range of the advanced battery.

19. The chairman of CARB, Dr. Alan C. Lloyd, was appointed as Chairman of the California Fuel Cell Partnership four months before the electric car mandate was killed in favor of hydrogen fuel cell technology.

20. While it is predicted that ANWR could supply America with slightly more than one year's supply of oil, simply raising fuel economy standards to 40mpg could save the same amount of fuel within 15 years.

21. GM's electric car, the EV1, was fast. A prototype set the land speed record for electric cars in 1994 at 183 miles an hour. EV1s accelerated to 60 mph in under 9 seconds, and to 30 mph in under 3 seconds. (according to http://ev1-club.power.net/ev1faq/ev1faq.htm)

RUMOR vs. FACT

RUMOR : The EV1 was designed to comply with the crash-safety and equipment regulations of the early 1990's, and not, therefore, fully compliant with safety regulations by the time they came out in 1996.

FACT (answered by former EV1 specialist Chelsea Sexton):

All of the EV1s leased were fully safety compliant. They passed NHTSA crash tests, and GM crash tests.

In addition, the claim that the car was once compliant in the early 90s but by 1996 was not, and that GM decided it wasn't cost effective to make it compliant is specious- that wouldn't be a call GM would be entitled to make. You don't get to be non-compliant because you don't feel like complying.

Safety regulations that would have gone into effect after the EV1 program was discontinued would have required fortified side impact beams and side curtain airbags, and the EV1 design would have had to be modified to meet those requirements- though it wouldn't have been cost-prohibitive to do so.

While GM has cited several reasons for the discontinuation of the EV1 program, not being safety-compliant wasn't one of them. To suggest otherwise without proof is insulting to the engineers who worked so hard to bring what has been called not only the best electric vehicle, but the best-engineered small car in GMs fleet, to market.

For further information, here's the result of EV1 safety testing:

http://www.nhtsa.dot.gov/NCAP/Cars/686.html

Alternative Automobile Technologies and Fuels

The following are among the alternative automobile technologies currently in use or in development. Some are promising, some are overhyped. If the electric vehicle had not been withdrawn by automakers, we could be driving it today, while waiting for a better alternative to be widely available, affordable, and practical.

Click on a table entry to locate the following information:

1) Hybrid Cars	Pro	Con	Vs. EV
2) Plug-in Hybrids	Pro	Con	Vs. EV
3) Ethanol	Pro	Con	Vs. EV
4) Biodiesel	Pro	Con	Vs. EV
5) Li-ion battery	Pro	Con	Vs. EV

1) Hybrid Cars: Hybrid cars combine an internal-combustion gas engine with an electric motor and a high-capacity battery (the market leader, Toyota Prius, uses a nickel metal hydride battery similar to the second-generation EV1's).

Hybrids Pro:

- Hybrids are a practical reality now. There are currently several Japanese and American production hybrids available for consumers at affordable prices (albeit somewhat higher than their conventional counterparts).
- Compared to conventional gas cars, hybrids produce lower emissions and enjoy greater fuel economy (varying among different hybrid models).
- Hybrids do not require plugging in to the electrical grid.
- Through regenerative braking, the high-capacity battery recaptures energy when the brakes are applied.

Hybrids Con:

- While fuel economy and emissions are improved, they are still not ideal.
- Many larger hybrid models, particularly hybrid SUVs, have mileage in the 25 mpg range, which is a small improvement over conventional SUVs but hardly a great step in fuel economy.
- Some hybrids are engineered for heightened performance, e.g. faster acceleration and stronger horsepower, rather than for fuel economy.

Hybrids Compared with EV:

- The EV produced no emissions at the tailpipe, whereas the hybrid is still a gasoline user and CO2 producer.
- The hybrid is considered the practical transition to future zero-emission technology, but the EV just as feasibly could have played a major part in that transition as well.

2) Plug-in Hybrids: Plug-in hybrids are conversions of production hybrid cars to add a more powerful battery that can be charged by plugging in to the electrical grid. The car's battery monitoring and control system is converted as well. (see Links page for more information).

Plug-in Hybrids Pro: Hybrids converted to plug-in electric are far more efficient than production hybrids and can travel 60 miles before using any gas.

Plug-in Hybrids Con:

- Since these plug-in hybrid systems are not yet mass-produced, currently they are not readily available and affordable to the consumer.
- This after-market conversion could affect or void manufacture warranties.

Plug-in Hybrids Compared with EV: The plug-in hybrid overcomes the problem of limited range in the pure EV. Pure EVs can only travel between charges on the power that can be stored within the battery, but a plug-in hybrid can transition to gas power for longer-range driving when needed.

3) Ethanol is a biofuel derived from plants, most commonly sugar cane or corn, which is usually mixed with gasoline. In the US, an 85% gasoline/15% ethanol mixture called E85 is the standard that can be used in "flex-fuel" engines. Brazil (the world's largest producer of sugarcane) is the world's largest producer and user of ethanol, made from sugarcane. In the US (the world's largest producer of corn) ethanol is mostly produced using corn.

Ethanol Pro:

- Ethanol is produced from a renewable source, plants. Its use could reduce US dependence on petroleum and aid the US economy by raising grain commodity prices.
- Currently 30 models of US consumer vehicles, or some 5 million and growing, are flex-fuel enabled and can run E85.

- Production of ethanol is booming in the US—up to 5 billion gallons this year from 1 billion in 2001. Thirty ethanol plants are currently under construction.

Ethanol Con:

- Currently, E85 is as costly or costlier for consumers as gasoline.
- Few fueling stations, mostly concentrated in the Midwest, offer E85 for sale.
- On balance, ethanol derived from corn is not an energy-efficient product or a significant clean-energy improvement over petroleum:

    a. Ethanol yields only about 10% more energy than that which was required to produce it, according to a study by the American Institute of Biological Studies. Growing, transporting and distilling corn, the main source of US ethanol, requires almost as much energy input to make the ethanol as the energy to be derived from it.

    b. Gallon for gallon, ethanol yields much less energy than petroleum, so a car using an ethanol mix will get less fuel economy than one powered exclusively from petroleum. According to the US Dept. of Energy, vehicles that run on ethanol derived from corn and grain are 25% less fuel efficient than cars running on gas.

    c. Ethanol derived from sugar cane is much more fuel efficient than corn ethanol; sugar ethanol can yield 4 to 8 times as much energy as the energy input required to produce it.

    d. Ethanol could be made from "biomass," or waste products from lumber and agriculture. This would not require the intensive agricultural investment of traditional sources of ethanol. Current technology hasn't advanced to make ethanol-derived biomass an economy of scale.

    e. Two agribusiness giants, Archer Daniels Midland and Cargill, together produce 50% of domestically manufactured ethanol.

    f. Agribusiness and corn-producing states have pressured Congress to mandate increased ethanol production and tax

incentives. These federal mandates today account for the booming production of ethanol in the US.

Ethanol Compared with EV: Ethanol made from corn uses as much nonrenewable energy to produce as the renewable energy that can be derived from it. Electric vehicles use less nonrenewable energy than they conserve. While ethanol appears to be a "green" fuel, the intensive agriculture practices involved in growing and processing corn and other grains use high energy and create high pollution. Ethanol benefits agribusiness more than it benefits the US consumer or the environment.

4) Biodiesel is a fuel derived from renewable plant or animal sources, potentially including recycled products. Biodiesel typically mixes vegetable oil or animal fat with an alcohol and a catalyst, yielding biodiesel and glycerin. It can be used as a pure fuel or mixed with traditional diesel fuel, yielding blends such as B5 (5% biodiesel, 95% diesel), B10, B20. Only pure biodiesel (B100), however, is regarded as an alternative fuel under the U.S. Energy Policy Act of 1998.

Biodiesel Pro:

- Biodiesel is a clean-burning, domestically-produced, renewable fuel that is currently available and in use in conventional diesel engines with minor modifications (engines running on pure biofuel may require modifications whereas those using blends of B5, B10 or B20 don't).
- Emissions are significantly cleaner than conventional diesel fuels.
- Since biodiesel performs as well as traditional diesel, it can be used in passenger cars or fleets of larger vehicles. According to the National Biodiesel Board, there are over 400 major fleets in the U.S. powered with biodiesel.
- See the official site of the National Biodiesel Board for more information.

Biodiesel Con:

- Like ethanol, biodiesel is derived from agricultural products which carry their own costs in energy and pollution. However, biodiesel can be made from many and varied sources, so production could be optimized by using available agricultural overproduction and recycling rather than intensive monocrop production.

Biodiesel Compared with EV: Biodiesel is a promising alternative fuel that is not yet widely adopted or available. The EV was an alternative technology that already was available, and demonstrably delivered on its promises.

5) Li-ion Battery vehicles: A new generation of electric vehicles, such as the Venturi Fétish sports car, is being developed using more powerful Lithium-ion (Li-ion) batteries. Li-ion batteries are also used in some plug-in hybrid conversions.

Li-ion Battery Pro:

- Li-ion batteries yield five times as much energy as lead-acid batteries.
- Some electric vehicles can travel as far as 250 miles on a charge.
- Although they are currently very expensive, greater adoption could mean large-scale manufacturing that would bring down the price.
- Li-ion batteries are expected to be competitive with today's Nickel-Metal Hydride (NiMH) batteries for advanced automotive applications within a few years.

Li-ion Battery Con:

- Currently, a Li-ion battery pack that provides 100 mile range for an electric vehicle runs more than $10,000, or $100 per mile of range.
- However, much of that cost comes from battery assembly and the very low production volume. As adoption of the Li-ion technology for plug-in hybrids and electric cars increases, the cost is predicted to decrease by at least half.
- For example, the Li-ion battery pack that is used in the EnergyCS plug-in hybrid prototype costs over $1000 per kilowatt-hour (kWh), but large scale manufacturing by a major automaker for Li-ion batteries in the near future is anticipated to be bring the cost to well under $500/kWh.

Li-ion Battery Compared with EV: This could be the EV of the future: a powerful battery yielding long-range mileage in a pure EV or a plug-in hybrid.

Production Notes

It's not surprising that the people responsible for *Who Killed the Electric Car?* combine environmental awareness with futurist tech savvy and entertainment-world flair. Two of the principals—Director Chris Paine and Executive Producer Dean Devlin—were EV1 drivers themselves.

Devlin and his fellow Executive Producers, Richard Titus and Tavin Marin Titus, have all been leaders in bringing digital technology to film and television production. Chris Paine and Richard were both '90s "digerati." "We knew each other as friendly rivals in the Internet boom," recalls Richard Titus, whose new media agency Razorfish (and later Schematic) competed with Paine's Internet Outfitters (later AppNet/Commerce One).

Here's how an assortment of green-showbiz-techy-journalist-filmmakers pulls together a documentary production. "I had been working on this for about a year with co-producer Kathy Weiss and my friend Roger Gilbertson," says Paine. "When we needed more producing support, I went to Tavin and Richard." Tavin and Richard Titus were quickly drawn to the story. "We thought immediately of Dean Devlin," recalls Richard. "Tavin had worked with him for years. Dean drives an electric car, he's a dedicated environmentalist, and he's a hugely successful commercial film producer who could make this project happen."

Finally, the team brought in Jessie Deeter, whose journalistic documentary background with "FRONTLINE" rounded out their experience. "Jessie's relentless pursuit of CARB and the auto industry resulted in getting informed industry insiders like Alan Lloyd, Tom Everhart and John Dabels to talk with us," says Paine. Deeter recalls: "After having two of our key interviews from General Motors cancel on the same day, I knew that we were going to have to work extra hard to get all sides of the story."

Richard Titus explains why so many well-known faces became part of the documentary. "As the program wound down, celebrities were the only people who could get the EV1. I wanted to lease one, but Chelsea [the GM sales specialist who became a EV activist] told me I was wasting my time with the size of the waiting list. Celebrities were in a position to embarrass GM if they couldn't get a lease, so they got the

cars. As Chelsea said, you didn't stand a chance if you were a dentist from the Valley."

One of the most dramatic episodes in the making of the film took place before the production team was firmly established. "Chris got a tip from the EV activist grapevine that GM was trucking the repossessed EV1s to the GM proving grounds in Arizona," says Tavin Titus. "He called from down there and said "We have to rent a helicopter now!" We hadn't assembled production financing or crew yet, but our "Shoot Now, Pay Later" decision turned out to be crucial. About two days before Christmas, Chris flew around in the helicopter over the vast proving grounds and stumbled upon the pile of 50 EV1s sitting next to the crusher. We all got the chills when we saw the footage." That documentary evidence would make a startling contrast to GM's claim three months later that every part of those vehicles would be recycled.

"For those of us who drove and loved these cars," says Dean Devlin, "It was enormously frustrating because this story was never told in the press. We couldn't understand why. Every time the story of the electric vehicle was told, it was from the car companies' point of view, and filled with bad information, even from very good media outlets. It shocked me. We only knew about this because we were personally involved as EV1 drivers. We realized that this story was not going to get told unless we told it."

"Documentaries bring big stories to the public in ways other media can't," says Paine. At first, I just wanted to share the amazing experience of driving an electric car, because they were impossible to get outside of California and Arizona. When they started taking them off the road, I knew we had better start shooting. What we discovered was a lot more than a story about a car."

Director of Photography Thaddeus Wadleigh anchored the project in High Definition technology. Multiple camera operators (many of them volunteer) captured some of the film's best moments on smaller cameras. Veteran Cinematographer Jim Matsloz shot most of the footage of the EV1 on the road, including the race on the Willow Springs race track. Editors Michael Kovalenko, Chris A. Peterson, and Associate Producer Natalie Artin worked with the team to assemble 200 hours of footage, archives and transcripts into our final film.

"We can't sustain a world where we consume so much oil and create so much pollution just to drive our cars," said Paine. "As filmmakers,

we just wanted to start a little fire with this film." Richard Titus adds, "We wanted to leave people inspired to reshape the future."

About The Filmmakers

CHRIS PAINE (**Director)**

Chris Paine drove a GM EV1 from 1998-2003. After GM confiscated his EV1, he bought a Toyota RAV4 EV—which were briefly available for sale. He still drives it.

Who Killed the Electric Car? is Chris's first feature documentary as director. Previously he was an executive producer on *Faster* (2003), about MotoGP, the world's fastest motorcycle race (with narration by Ewan McGregor), and Mark Neale's *William Gibson: No Maps for These Territories* (featuring Bono). *No Maps* was named "Best Documentary" by the Los Angeles New Times in 2001. Chris has directed segments for the MTV/Initial television series BUZZ as well as the personal documentary *Return to the Philippines*. He assisted writer/producer Michael Tolkin on the feature films starting with Robert Altman's *The Player* (1992), and *The New Age* (1994) and *The Rapture*(1991). He has also produced short subjects including *Mailman*, which premiered at the 1995 Sundance Festival. His improvisation experience included two seasons with the Los Angeles performance group "Theatersports".

Before becoming a full-time filmmaker, Chris founded Internet Outfitters which became AppNet/Commerce One in 1999, one of the early players in California's internet boom. The firm created marketing and customized software services for corporate customers and nonprofits. He merged the firm to AppNet, Inc. as part of an IPO in 1999. Chris served as President of AppNet's operation in Southern California until the firm merged with Commerce One in 2000. Chris also co-founded the robotics developer Mondo-tronics in San Rafael with Roger Gilbertson. Mondo-tronics provided its nickel titanium "muscle wire" to NASA's Mars Pathfinder mission.

On the activist front, Chris worked on the Nuclear Freeze and the Nevada Nuclear Test Site actions in the 1980s as well as protests at the Concord Naval Weapons Yard during the US backed contra war in Nicauragua. He also shot footage for the California Coastal Commission to fight a proposed freeway bypass around Devils' Slide. Currently Chris supports the work of the Rainforest Action Network, Conservation International and the Amazon Conservation Team.

JESSIE DEETER (Producer)

Jessie Deeter is a veteran documentary filmmaker and journalist. She produced, reported, directed and shot *No More War*, a 22-minute documentary that aired on PBS' FRONTLINE/World in May 2005. Reviewed positively in the New York Times, *No More War* has been submitted for a DuPont award by FRONTLINE. The hour-long version of that documentary, *Keeping the Peace*, is currently in post-production. Jessie field-produced *Afghanistan: Hell of a Nation*, a 45-minute documentary on Afghanistan's Loya Jirga that aired on PBS' Wide Angle in September, 2004. In 2003, Jessie traveled to five countries to field produce a documentary for the Asia Foundation's 50th anniversary. Prior to that, Jessie worked as an associate producer for FRONTLINE/World and FRONTLINE's *Modern Meat* and *Blackout* documentaries. Her half-hour documentary, *Some They Win*, on Mexican workers at the racetrack, screened in several festivals around the country. Jessie has a Masters of Journalism and International and Area Studies, Middle East focus, from UC Berkeley.

Jessie drives a 2000 Honda Insight Hybrid.

DEAN DEVLIN (Executive Producer)

Dean Devlin drove a GM EV1 from 1998 to 2001. After GM confiscated his EV1, Devlin bought a Toyota RAV4 EV—the last one available for sale. He still drives it.

Dean Devlin is Chairman and C.E.O. of Electric Entertainment, the company he founded in May 2001 to produce motion pictures and develop interactive, music and television projects. Over the last 12 years, Dean Devlin has co-written and produced some of the most successful feature films of all time. Devlin co-wrote and produced *Stargate* and *Independence Day*, which has grossed over $800 million worldwide. He co-wrote and produced *Godzilla*, and produced *The Patriot* starring Mel Gibson, which was nominated for three Academy Awards.

Under the "Electric" banner, Devlin has produced "Eight Legged Freaks," released by Warner Bros. and Village Roadshow in July 2002; New Line's Fall 2004 release "Cellular" starring Kim Basinger; and "The Librarian" which aired on TNT network in December 2004 and was the highest rated movie on cable that year. In spring of 2005, Devlin produced the World War I epic "Flyboys," starring James Franco, Martin Henderson and Jean Reno which MGM will distribute fall 2006.

Devlin also recently executive produced along with Bryan Singer the Sci Fi Channel's six-hour mini-series event "The Triangle." Devlin recently wrapped production in Africa for the sequel to "The Librarian," entitled "The Librarian: Return to King Solomon's Mine." "Librarian 2" is scheduled to air in December of 2006 on TNT.

TAVIN MARIN TITUS (Executive Producer)

Tavin Marin Titus is a partner, with her husband, Richard Titus, in Plinyminor, a production company founded in 1999 that uses a broad variety of innovative digital and analog formats, often melding the best of both to create cost effective, yet creatively compelling work. Tavin's experience spans over twelve years in both independent and studio filmmaking.

Tavin's most recent films include features *Mammoth* and *Alien Lockdown*, both currently on Sci Fi Channel. Tavin and Plinyminor also produced all of the news broadcast and playback video footage featured in Roland Emmerich's *The Day After Tomorrow*. Prior to this, she produced several short subjects and feature films, including the independent feature *On_Line*, which premiered at Sundance and Berlin Film Festivals and played theatrically in the US from July to December of 2003. Other projects include the award-winning *Taking the Whee*l, directed by David Ackerman and starring John Cleese, and a pilot for Sci Fi Channel entitled *The Man with No Eyes*, written and directed by partner Tim Cox.

Prior to founding Plinyminor, Tavin's film career included work as assistant to Dean Devlin at Centropolis Entertainment on *Independence Day* and *Godzilla*, and as the production executive on *The Patriot.* Tavin is currently in development and pre-production on *Lie Box* with director David Van Eyssen, Pliny's next Sci Fi picture and several feature film and television properties. Tavin and her husband Richard bought one of the first hybrid SUVs sold in California.

RICHARD D. TITUS (Executive Producer)

Focused on the crossroads of entertainment and technology, Richard has produced video games, films, television, cross and new media properties. His film career began at Brad Krevoy and Steve Stabler's Motion Picture Corporation of America, where he produced several video games and feature films, including *Corporate Ladder*. In 1997 Richard created and produced the pioneering parallel media webshow, THEVISITOR.COM, with Dean Devlin.

In 1999 he, with his wife and producing partner, Tavin, founded Plinyminor. Together they have developed and produced a variety of film and television projects including 2002 Sundance selection *On_Line*. In 2005, Richard produced Plinyminor's latest film for NBC Universal's Sci Fi Channel, *Mammoth*, which was filmed in Louisiana and Bucharest, Romania. He is currently at work on Pliny's five film scifi slate and *LieBox*, a feature film set to shoot in London, UK in 2007.

In addition to Plinyminor, Richard is co-founder and remains the Vice Chairman of leading interactive agency Schematic, one of the largest and fastest growing interactive agencies in the US, whose clients include ABC/Disney, Cablevision, Comcast, Microsoft, Sony, Target and Yahoo. Richard is a regular panelist, keynote speaker and futurist at industry events and for corporate clients including and in 2005 keynoted TimeWarner's annual management summit Time4Tomorrow.

KATHY WEISS (Co-Producer)

Kathy's television experience includes producing and directing for USA Networks Before and Afternoon Movies and Fine Living Televisions Ten Perfect Summer Getaways. Kathy also served as writer/director/producer of On-Air Promotions for Comedy Central, working with such shows as The Daily Show with Jon Stewart and South Park. In addition to line-producing Mark Hamill's directorial debut *Comic Book: the Movie*, Kathy has produced national television and radio campaigns for clients including Mercedes-Benz, and Sun Microsystems.

RACHEL OLSCHAN (Co-Producer)

Rachel Olschan has been with Electric Entertainment since its inception in 2001. She most recently served as co-producer on TNT's second installment of *The Librarian* titled *The Librarian II: Return to King Solomon's Mine* starring Noah Wyle.

In 2005 she associate produced the feature film FLYBOYS, starring James Franco, Martin Henderson, and Jean Reno and directed by Tony Bill. She also served as associate producer on the Sci Fi Channel mini-series *The Triangle* starring Lou Diamond Phillips, Eric Stoltz, and Catherine Bell and executive produced by Dean Devlin and Bryan Singer. Olschan was the associate producer on TNT's original movie*, The Librarian: Quest for the Spear.*

JEFF STEELE (Associate Producer)

Jeff is a partner in the Los Angeles based production company, Plinyminor, where he facilitates and oversees the acquisition, finance and co-production of film and television projects. Most recently he was a Co-Producer on *Mammoth*. Before joining Plinyminor, he worked as an executive at FilmCrest Corp. and before that at Mike Medavoy's Phoenix Pictures. Jeff is a co-founder and board member of the non-partisan, non-profit political and entertainment think-tank, The Hollywood Hill, and is editor of the film finance blog, FlikCents.com.

NATALIE ARTIN (Associate Producer)

Natalie's interest in journalism and the entertainment industry began when she was the Editor-in-Chief of UC Santa Barbara's Arts, Entertainment and Student Life magazine, CampusPOINT. After completing her B.A. in 2003 with a major in Communications and a minor in English literature, Natalie held various production positions at E! Entertainment Networks for shows such as E! True Hollywood Story and Fashion Police. She also served as Script Coordinator for the Travel Channel's Amazing Vacation Homes.

MICHAEL KOVALENKO (Editor)

Michael is a New York-based editor whose most recent project, *Liberia: an Uncivil War*, has won numerous awards in film festivals around the world and was nominated for two Emmys. The film is being distributed for television domestically on Discovery Times Channel and in the United Kingdom on the BBC. Prior documentary film projects include *Freaks Like Me, Last Two Seconds,* and *How to Eat Your Watermelon in White Company and Enjoy It*. Michael has a BA in graphic design and experience with motion graphics, 3D animation, web design and audio editing.

CHRIS A. PETERSON (Editor)

Editor Chris A. Peterson is the founder of Red Editorial in Los Angeles, a boutique post production facility whose focus is independent film and documentary. In 2004 Peterson edited In Time, an Official Sundance Selection that premiered on HBO this past November. Peterson received his Masters and BA in Film from San Diego State University and University of California at San Diego.

Links to Additional Information

Film Website: http://www.whokilledtheelectriccar.com

The *Who Killed the Electric Car?* website has a Links page with a wealth of relevant links to further information in the following categories:

- Car Companies
- Actions to Improve Industry
- Hybrid Cars
- Electric Car and Plug-In Hybrid Research and Development
- Electric Car Publications, Documentaries, and Articles
- Sites for Electric Vehicle Education and Action
- Actions to Stop Crushing electric Cars
- Activist Sites
- Sites Promoting the Hydrogen Highway
- NEVs (Neighborhood Electric Vehicles, good for errands around town)

The following is a sample of sites listed on the the *Who Killed the Electric Car?* website. Please visit the website for more comprehensive listings.

AC Propulsion: developer of the tZero super-car, EV conversions, and other new technology: http://www.acpropulsion.com

CalCars—the California Car Initiative: a non-profit promoting plug-in hybrids: www.calcars.org

Valence Technology: developer of advanced Li-ion batteries for electric vehicles: www.valence.com

Union of Concerned Scientists: www.ucsaction.org

Natural Resources Defense Council—Break the Chain: www.nrdc.org/breakthechain

EV World online magazine: www.evworld.com

National Biodiesel Accreditation Program: www.bq-9000.org

US Department of Energy's Hydrogen Program: www.hydrogen.gov