

# ***Electric Vehicles – Our Only Alternative***

By

*Bob Batson*

***Electric Vehicles of America, Inc.***

*In 1991, I wrote <sup>1</sup> that Electric Vehicles (EVs) would:*

- *Clean our air*
- *Decrease our demand for imported oil*

*Thirteen years have passed. We have cleaner air but our oil imports have increased to more than 56% of our oil consumption.*

*My paper also stated that EVs are Energy Independent because many different sources of energy can be used to generate the electricity used to recharge the batteries. And that EVs utilize both methods of minimizing air pollution:*

- *EVs are a cleaner source of energy.*
- *EVs are more efficient.*

*At that time, I thought the 1990s would be the decade of the Electric Vehicle.*

*In 1992, President George Bush signed the Energy Policy Act <sup>2</sup>(EPAAct) to decrease our demand for imported oil. EPAAct required all municipal, state, federal, and utility fleets to purchase Alternative Fueled Vehicles (AFVs) starting at minimal levels and increasing to 70% of all fleet purchases in 2003. There are token AFVs being used today. President Clinton did not enforce the 1992 EPAAct.*

*In October 1998, Design News <sup>3</sup> reported that “Federal and state agencies have failed miserably in adding EVs to their fleets.... Of the 585,000 vehicles in the federal fleet, only about 200 are electric.....A battery pack for a Ford ranger EV cost more than \$30,000, and Ford sells the truck for \$32, 795. The battery pack for GM’s EV1 costs about \$45,000. Of course these prices reflect very low volume and would come down if many more vehicles were sold.” One engineer asked “Who are the 100,000 soldiers who will sacrifice themselves to drive EV prices down?”*

*Daniel Sperling wrote “A Case for Electric Vehicles” <sup>4</sup> for Scientific American magazine in 1996. This article discusses battery operated EVs as well as EVs powered by ultracapacitors, flywheels, and fuel cells. The article further states that “Although automakers worldwide have spent perhaps \$1 billion on electric vehicles during the 1990s, this investment is relatively small. The auto industry spends more than \$5 billion a year in the U.S. alone on advertising”.*

*The article further states “Much of the investment made so far has been in response to governmental pressure. In 1990, California adopted a zero-emission vehicle (ZEV) mandate requiring that major automakers make at least 2 percent of their vehicles emission free by 1998.... The major automakers aggressively opposed the ZEV mandate but rapidly expanded the electric-vehicle R&D programs to guard against the possibility that their regulatory counterattacks might fail.....California regulators gave in to the pressure from both the automobile and oil industries and eliminated the quotas.” The Bush Administration sided with the automakers in opposing the California Regulations in 1992.*

*So the bottom line is that we know that EVs are an answer to our pollution and imported oil problem; yet the very people (the automakers) who can solve the problem oppose the solution. They automakers claim that EVs cost too much money. And in order to prove their point, they make them expensive. General Motors made the EV1 which they leased. The EV1 proved to be so popular that GM recalled all of them and crushed most of them to prevent their engineering and design from being used.*

*The true reason is that the automakers make their money from the internal combustion engine and all of the maintenance requirements it imposes (tune-ups, oil changes, exhaust system replacements, cooling system repairs, etc.). Asking the automakers to develop EVs is like asking IBM in the late 1970s to develop a personal computer. IBM made their money in mainframes; if the government funded PC development, PCs would be expensive with limited capabilities. The only reason we have PCs today is because of small businesses that had a vision!*

*Our federal government continues to fund transportation development with the major automakers. Haven't we learned our lesson; isn't there a better way?*

*In the 2003 State of the Union President George W. Bush declared his support for the hydrogen economy and the fuel cell vehicle.<sup>5</sup> The President stated “With a new national commitment, our scientists and engineers will overcome obstacles to taking these cars from laboratory to showroom, so that the first car driven by a child born today could be powered by hydrogen, and pollution free.”*

*In the report “Carrying the Energy Future”<sup>6</sup> it is stated “Those obstacles are considerable, in significant measure because they involve creating an entirely new system of energy production and delivery on the scale of today's power grid. The cost in the United States alone has been estimated at between US\$200 billion and US\$500 billion.” In this report they compared the hydrogen option to the use of the existing electrical option with advanced batteries (Li-ion, NiMH). Some of their conclusions are:*

- *Direct Electricity (92%) is far more efficient to transport than Renewable Hydrogen (ReH) (45-63% pipeline).*
- *Advanced batteries is a more efficient means of energy storage than ReH by a factor of 1.6. That is 60% more efficient in storage.*

- *EVs can provide twice the useful work for the same energy when compared to ReH – fuel cell vehicles.*

*A National Research Council report<sup>7</sup> on the hydrogen fuel cell for automotive application identified many problems and the impact on oil imports and carbon dioxide emissions are likely to be minor over the next 25 years. The report also stated “If battery technology improved dramatically ..... all-electric vehicles might become the preferred alternative.”*

*Let’s look at all of these conclusions of these various reports to understand where we are:*

- *EVs will decrease oil imports.*
- *EVs will clean our air.*
- *Electricity is a more efficient means of transporting energy.*
- *Batteries are a more efficient means of energy storage.*
- *Fuel Cell vehicles will have a minor impact on oil imports or air pollution for the next 25 years.*
- *The automobile manufacturers are opposed to EVs.*

*In 1991, I was optimistic about EVs for the coming decade because we had EPAct and eight other pieces of proposed legislation. **And we had time.** That time has now disappeared and we will soon be faced with another oil crisis. On November 16, 2004 the Oil Depletion Analysis Centre in London reported that oil supplies will remain tight through the rest of this decade.<sup>8</sup> It is worse than that – Peak oil production (world supply) will not meet demand!*

*Hubbert’s Curve developed in 1956 by M. King Hubbert identified when peak oil production would occur. For the U.S the curve predicted 1972. Peak oil production actually occurred in 1970. Do you remember the gasoline lines in 1973? At that time, we in the U.S only imported 36% of our oil. Now we import 56% of our oil.*

*Hubbert’s Curve for peak world oil production is now! And world demand for oil is increasing. That means that demand will quickly exceed supply. China once an exporter is now an importer. In fact, there are only four countries that will not reach their peak for 20 years: Abu Dhabi, Kuwait, Iraq, and Saudi Arabia.*

**So here's the problem:** Our current means of transportation is based on solely on oil. The automakers want us to wait 25 years for possible fuel cell vehicles, but the demand for oil is now exceeding supply. We must act now!

**And here's the only immediate solution:** The federal government must encourage conversion of existing internal combustion vehicles to EVs. They can do that by providing a \$4000 tax credit (not deduction) for conversions!

Most conversions cost \$6000 - \$10,000. If EV owners can receive a \$4000 federal tax credit that decreases the cost to \$2000 - \$6000. This completely changes the economics in favor of EVs over internal combustion vehicles. As identified in my letter to President George W. Bush, \$8 billion can put 2 million EVs on the road. This will decrease our demand for oil, clean our air, and create a market for better batteries!

### **References:**

1. "Electric Vehicles – The Clean Alternative" by Bob Batson, *Electric Vehicles of America, Inc.* 1991.
2. 1992 Energy Policy Act. Public Law 102-486, Title III, October 24, 1992.
3. America Online News, October 22, 1998.
4. "A Case for Electric Vehicles", Daniel Sperling, *Scientific American*, November 1996. [http://www.physics.ohio-state.edu/~kagan/phy367/P367\\_articles/Trans\\_ElectricCars/ElectricVehicles96.html](http://www.physics.ohio-state.edu/~kagan/phy367/P367_articles/Trans_ElectricCars/ElectricVehicles96.html)
5. Bush, President George W., *State of the Union Address 2003*, January 28, 2003.
6. "Carrying the Energy Future – Comparing Hydrogen and Electricity for Transmission, Storage, and Transportation", Patrick Mazza and Roel Hammerschlag, *Institute for Lifecycle Environmental Assessment*, June 2004. ([www.ilea.org](http://www.ilea.org))
7. "The Hydrogen Economy: Opportunities, Costs, Barriers, and R&D Needs", National Research Council, Board of Energy and Environmental Systems. Washington DC, National Academy of Sciences. 2004. ES-2.
8. Solar Quest iNet News Service, November 16, 2004. <http://www.hubbertpeak.com/news/article.asp?id=8228>

### **Other links:**

[www.eia.doe.gov](http://www.eia.doe.gov)  
[www.financialsense.com/series3/part1.htm](http://www.financialsense.com/series3/part1.htm)  
<http://wolf.readinglitho.co.uk/mainpages/hubbert.html>  
[www.oilcrisis.com/](http://www.oilcrisis.com/) summary

Use search "Hubbert's curve"

### **Books**

*The End of Fossil Energy*, John Howe, McIntire Publishing, 2004.  
*Hubbert's Peak: The Impending World Oil Shortage*, Kenneth S. Deffeyes, Princeton Press, 2003

RDB 2004