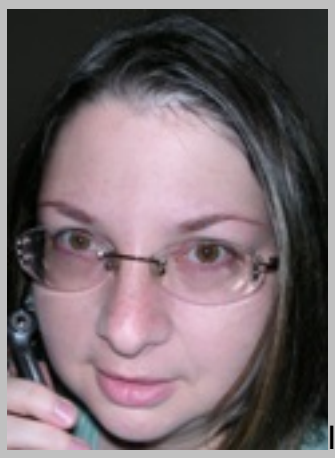
Brainstorm: Advanced Technology Vehicles

How can Advanced Technology Vehicles penetrate the mainstream automotive market?

Alex Campbell, ZAP, www.zapworld.com [1]

ZAP has always believed that the technology has been here for decades to make practical vehicles using advanced technologies, there simply has been no collective will to bring these ideas to market. Energy, government and auto experts in this country actually started calling attention to this problem in the 70s and I believe if we had addressed these back then, we wouldn't be in the trouble we are in the US currently. The technology has moved forward dramatically since that time, although little has reached the marketplace. But are advanced technologies the key to bringing innovation to the mainstream? No. Advanced technology vehicles are already superior in many situations, but they are not available on a mass-scale, so in general they will be more expensive. Governments should provide more tax incentives to offset the higher costs of these vehicles, much like President-elect Obama has proposed. People should start demanding new technologies and using them every day to create more demand and support innovative companies that embrace these technologies. This demand drives innovation and change and I believe over time these technologies will begin moving into the mainstream. For instance, demand for our wheel-motor scooters may result in a wheel-motor car in the future for ZAP, simply because of increasing consumer demand and better economies of scale for new technologies.

Lynne Mason, Electric Cars for Girls, www.electric-cars-are-for-girls.com [2]



I think if we want to introduce ATVs like electric cars in the mainstream market, we have to set aside "one size fits all" thinking. We don't all need to go 75 mph on the freeway with 4 kids and a dog, but that's the vehicle Detroit has been selling.

For example? NEVs for graduated licensing programs. Neighborhood Electric Vehicles (like Zenn and Miles) are already in production, but are not the best fit for the average American driver because of the limitations - limited speed (25mph), limited range (30 miles), limited passenger space (seating for 2). These limitations, though, are exactly the characteristics that would make them a natural fit for teenaged drivers in graduated licensing programs.

Graduated licensing programs have been adopted in many US states because young drivers are more likely than the rest of us to get involved in car accidents, and research shows those accidents usually happen because of excessive speed, unfamiliar territory and conditions, and having too many other kids in the car. Those accidents are too often fatal. In response, lawmakers designed programs to "phase in" driving privileges as kids get more experience and prove themselves responsible.

Here's the rub, though; the kids are still driving gas-guzzlers that are capable of breaking their license restrictions, so enforcement of the graduated license totally rests with the police department. A lot of those fatal car crashes happen with teens who have "never done that sort of thing before" - responsible, straight A students who simply make one bad error in judgement. With an NEV, there's no question about complying with the terms of the license. The car does it for you.

The truth is, all vehicles have their strengths and limitations. A weakness in one setting is a strength in another. Alternative marketing will bring alternative technology into the mainstream car market.

Nathan John, Platform NEC Electronics America, www.am.necel.com [3]

Passive safety measures have reached a point of diminishing returns in automobiles, and future big gains will come with the inclusion of active safety systems. The next big goal must be to make cars that do not crash in the first place.

To accomplish this goal, car manufacturers and their suppliers are developing a wide variety of active safety applications, for lane departure warning, traffic sign detection, obstacle detection and other safety systems. Different types of sensors are being used for these various applications, including radar, lidar and vision sensors. Some sensor types are picked more often for certain applications. For instance, radar is often picked for obstacles, while vision systems are used for signs.

One trend in the market is to merge more than one application on the same system, thereby giving the end customer more safety features with a relatively small incremental cost. If the system only needs a single sensor to support multiple applications, that solution makes even better economic sense.

Only one sensor system has proven successful in all of these safety applications, and that system is the vision-based sensor. This solution has not yet been delivered in electronic form, but we need only look to ourselves as the proof that vision-based processing is sufficient to enable someone to drive a car reliably. Going forward, the challenge will be to provide the raw processing power and algorithms that can extract information from the scene effectively. This challenge can and will be overcome. Maybe not your next car, but probably the one after that, will include a vision system to help make you safer.

Zan Dubin Scott, Plug In America, www.pluginamerica.org [4]

I've been driving an Electric Vehicle (EV) for six years and 65,000 miles. My Toyota RAV4 EV requires no oil or filter changes, no tune ups and virtually no repair. In six years, I've replaced the shock absorbers, period. For the equivalent of less than $1 per gallon gas, I traverse L.A.'s. freeways at 65 miles per hour emitting zero pollution. Shouldn't the question be how can ATVs not penetrate the mainstream automotive market?

Plug-in technology is indeed ready for prime time and consumers worldwide will be driving EVs and plug-in hybrid electric vehicles (PHEVs) in significant numbers starting in late 2010. That's when GM vows to launch delivery of its Volt PHEV. GM is not alone. Virtually every major auto manufacturer is developing these cars including Chrysler, Ford, Nissan, Volvo, Mitsubishi, Subaru, Think, BMW, Mercedes,

Hyundai and China's BYD and Chery. Smaller innovators such as Tesla Motors and AC Propulsion have already delivered EVs, the only cars that get cleaner—as our grid derives more and more of its fuel from renewable sources—with age. And there's already enough power in the grid during off-peak hours (when these cars get charged) to handle the daily commutes of most U.S. drivers, according to the Pacific Northwest National Laboratory.

America's major automakers will have to deliver on their green car vows. That will cost billions and we know they're enduring dire financial challenges. We also need consumers to step up and purchase plug-in cars to bring down the cost of battery technology through mass production. But we're facing the immutable reality of peak oil and unprecedented environmental threat. We must reduce our dependence on foreign oil. There is reason for optimism. As communications director for Plug In America, the nonprofit organization leading the nation's plug-in vehicle movement, I receive weekly, sometimes daily calls from mainstream media requesting interviews and information. The word has gotten out. Our country now has the leadership we need, as well. President Elect Obama wants to put one million plug-in cars on the road by 2015. Plug In America wants that to see that many three years sooner. But it's an inspiring start.

Dr. Peter Schulmeyer, Freescale Semiconductor, www.freescale.com [5]

What will the ultimate – yet practical – sustainable vehicle look like down the road?

If I were a betting man, I'd put my money on pure-electric cars as the mainstay for tomorrow's commuter vehicles. However, the transition to electric cars will occur in stages tempered by practical considerations, such as the continuing need for reliable, market-proven powertrain and battery systems.

Responding to market demand for smaller, more fuel-efficient and environmentally sustainable vehicles, the automotive industry is developing pure-electric cars in an evolutionary manner.

I see current hybrid electric vehicles (HEVs) and the next generation (plug-in HEVs or PHEVs, such as the Chevy Volt, which add the capability of charging off the electric grid) as stepping stones to pure-electric vehicles. The extra weight and cost of having both an electric motor and internal combustion engine (ICE) power source cancels much of the advantage over conventional ICE vehicles, especially considering the improvements in ICE technology in the R&D pipeline.

The real breakthrough will come with the migration to pure-electric vehicles. This will depend on consumers getting comfortable with PHEVs and the concept of grid-connected cars. Drivers will lose their fear of being stranded with a depleted battery once the infrastructure for electric "fueling" stations exists. This electric fueling infrastructure is only possible with the economic incentive created by an ample fleet of PHEVs on the road. The progression from HEV to PHEV and then to pure-electric vehicles cuts through the chicken-and-egg problem, which is preventing the introduction of new sustainable vehicle technology and the required matching infrastructure.

What a joy it will be to drive around town in a car powered by a quietly whirring motor that operates at mere pennies per mile.

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