

CalCars Founder Felix Kramer SVMG "Power and Motion" Conference AMD/Sunnyvale April 24, 2003

How California Can Continue to Lead the Way to Cleaner, More Efficient Cars (SLIDE 1: TITLE) Slides available at <http://www.calcars.org/calcars-svmg.pdf>. This talk at <http://www.calcars.org/calcars-svmg-doc.pdf>

We've come to a crossroads in transportation technology. The fossil-fueled internal combustion engine, whose design has barely changed for more than a century, is gradually giving way to electrically-powered vehicles.

Many people don't realize that the much-touted fuel cell vehicle is an electric vehicle -- the fuel cell is really just an energy storage mechanism, not a type of engine. But even with accelerated R&D and support from Washington, fuel cells won't be ready for mass production for at least another 7-20 years.

This means we need something to get us from where we are now to where we'll be in a decade -- in other words, a way to "bridge" the gap between our current technology and the technology of the future. It turns out we already have it: the hybrid vehicle.

Let's look more closely at hybrids

"Hybrid" cars have both a conventional gasoline engine and an electric motor. This combination brings much better mileage and significantly reduced emissions. Depending on the design, low-speed travel may be all-electric, and the electric motor may also join in as a "supercharger" to help the gasoline engine accelerate for high-speed passing or merging. This allows the gasoline engine to be smaller and more efficient, and be used less often. Hybrids also recapture some energy used in braking to recharge their batteries. It's important to remember that all their power comes from gasoline, and none are now designed to travel at high speed on batteries alone.

Hybrids are not theoretical or impractical. They have the same range as gasoline-powered cars. On the roads right now., they drive just like regular cars, and require no behavior change from drivers. Since hybrids usually shut off their motors at stoplights, it may take a while for new drivers to remember the car hasn't stalled. Five years ago, few people other than engineers and electric vehicle enthusiasts knew about hybrids. Today they're catching on well beyond environmentalists and early adopters, and far faster than the car companies -- or critics who said they'd never make it in the U.S. market -- anticipated.

The Honda Insight went on sale here in late 1999. The Toyota Prius followed in 2000. And the Honda Civic joined them in 2002. Sales are growing rapidly -- dealers are selling all the hybrids they can get: These cars don't sit around on lots. JD Powers projects combined 2003 sales at 58,000, up from 36,000 in 2002. Probably they could sell even more if they built more. Last week, Toyota unveiled its 2004 Prius, with another big leap in efficiency and features. (SLIDE 3 2004 PRIUS CONTINUES HYBRID EVOLUTION)

The more than 75,000 hybrids sold to date in the U.S. (SLIDE2:SALES) -- including over 20,000 in California -- represent a proven and affordable "bridging" technology for all car-buyers who want to save money on gas and reduce their impact on the environment, while also gradually reducing our dependence on imported oil.

When Honda and Toyota first introduced their hybrids, U.S. car companies said the technology wasn't "mature" and couldn't be manufactured at a profit. Now, just a few years after casting so much doubt, Ford, GM, Daimler-Chrysler and other car makers have reversed themselves, and have announced that they'll build hybrids too. (SLIDE4: HEVs IN PIPELINE) Unfortunately, having missed the boat initially, they're stuck playing catch-up and don't expect to equal the efficiency of current Hondas and Toyotas.

Some early U.S. efforts will barely qualify as hybrids. The small electric motors in some of GM's light trucks and SUVs will mainly allow the gasoline engine to turn off instead of idling when stopped, and run air conditioning and other accessories. The improvement will be about 2 miles/gallon in the city, zero on highway. Still, as this technology is increasingly incorporated into more vehicle lines, it's clear that advanced electric vehicle technology will become mainstream via hybrids.

Given that hybrids are already here and playing an increasing role in our transportation mix, but fuel cells and other "future" technologies won't be ready for mass production for at least 7-20 years, what can we do between now and then to further reduce gasoline consumption and increase protection for the environment?

The answer is a vehicle that actually already exists, and is essentially the "second generation" of the hybrids on the road today. Like current hybrids, these vehicles combine a gasoline engine with an electric motor and battery pack. The difference is that their batteries are much larger than those in current hybrids -- so they hold a lot more power. And that extra power gives the owners of second-generation hybrids more choices in how they can power their cars.

Statistics show that, on average, most people drive around 20 miles a day. This includes the round-trip commute to work, trips to the store, ferrying kids, going out for the evening -- everything. What second generation hybrids offer is the option of taking all these trips entirely on electric power -- that is, the gasoline engine never turns on at all -- and thereby saving even more money and producing even fewer emissions.

The key to these second-generation hybrids is that, in addition to being recharged by the car's gasoline engine (and when braking), you, the owner can also recharge the battery from any ordinary household electric outlet. That's why they're known as "plug-in" hybrids. And electric power is cleaner and more efficient than power from gasoline. (SLIDE5 EMISSIONS COMPARED)

So, for example, you could drive to work on electric power. At the end of the day, you'd drive home on electric power. Back home, you would charge up overnight while you're sleeping, at cheaper off-peak electric rates directly from your 120 volt outlet. Of course, with the gasoline engine always available, you never have to worry about charging the car. If you forget, don't have time, or it isn't convenient to re-charge, you can simply run on gas. If your daily commute is longer than 20 miles, you could "top off" your battery while the car is parked all day, but it's just an option. And for longer and out of town trips, your gasoline engines gives you unlimited range. The larger battery in a plug-in hybrid simply gives you more options -- more ways to save money on gas while reducing air pollution.

The hybrids on the roads today represent a good example of how we already "bridge" older gasoline and newer battery-electric technologies. Plug-in hybrids simply extend this bridge further into the future.

Plus plug-in hybrids offer further cost savings. Because they have fewer moving parts to wear out and produce less heat, electric motors last longer and require less maintenance. If you use the car mostly for local trips, you may need to visit a gas station only a few times a year. (SLIDE 6: FEWER TRIPS TO PUMP) And the Total Cost of Ownership -- that is, all car-related expenses over the entire life of the vehicle including purchase, fuel, maintenance and repairs -- can be lower. (SLIDE 7: LOWER TCO) Which means a lower cost per mile traveled.

So when can we get a plug-in hybrid? (SLIDE 8 BENEFITS)

From a technical point of view, there is nothing preventing them from being produced now. The technology already exists, and prototypes have already been built. Here's one by an advanced technology integrator (SLIDE 9 AC PROPULSION) and a few by a University team (SLIDE 10 UC DAVIS).

What about the economics? Larger battery packs do increase the cost by several thousand dollars. But the Electric Power Research Institute (EPRI), whom you heard from this morning, has documented both the steady improvements in battery technology, and the continuing decline in unit costs, leading to lower TCO. Of course, mass production will further reduce these costs, as it has for the long-life batteries in our laptops and gadgets.

Unfortunately, the car companies are relying on the same arguments they used against current hybrids to justify not building plug-in hybrids. They say they can't make a profit on them, that people don't want them, and that buyers won't pay more for a car with additional features and benefits. Remember -- this is exactly what they said about the first generation of hybrids, the ones that are now selling at a growing rate, and which they're all now planning to produce..

By the way, these are also the same companies that said that requiring seatbelts, catalytic converters, and airbags would put them out of business; that missed the small-car wave in the '70s, which cost them market share to imports in the '80s; that were surprised when Toyota started showing a profit on its hybrid; and that are now struggling to stay afloat. Detroit always seems to be one trend behind. Plug-in hybrids offers them a chance to get out in front of these trends for a change. And we in California can help them do it.

California has the missing ingredients

The U.S. needs better cars. Our air quality demands it, our trade balance demands it, and our oil-dependent foreign policy demands it.

California has a long and proud history of leading the nation in embracing new ideas and new technologies -- especially in transportation. (SLIDE 11 CALIFORNIA LEADS THE WAY) Once again, we have the opportunity to pioneer the evolution of personal transportation solutions with the least environmental impact.

For at least 10 reasons, California is uniquely positioned to change the status quo: [SAY NUMBERS]

1. We buy 10% of the nation's cars, and an even larger percentage of hybrids. In 2002, 20% of Honda and 25% of Toyota hybrids were sold in California. And last month, we accounted for one-third of Prius sales nationwide.
2. Our state agencies incubated many of the nation's most important auto safety and emission regulations. Other states follow our emissions standards, which are the nation's strongest.
3. We have an enormous pool of knowledgeable, environmentally-conscious, and well-organized consumers motivated to buy better cars.
4. Many California companies and local governments with large fleets are accustomed to using their purchases to make far-sighted choices. Many of these fleets already use significant numbers of hybrid, natural-gas and all-electric cars and trucks.
5. California consumers have also taken the lead in buying alternative-fueled vehicles such as all-electric and natural-gas powered cars. As a result, we have the most zero-emission vehicles on our freeways.
6. Palo Alto-based EPRI, which helps catalyze utility industry innovation, is producing high-level research and coordinating working groups on plug-in hybrids.
7. We have an abundance of automotive design resources in our universities and in Southern California's clusters of design and development groups for most of the world's car manufacturers.
8. We have advanced technology experts who've founded companies around the state that have spent the last decade working to commercialize all-electric vehicles, and along the way have developed intellectual property and components that can be used in plug-in hybrids.
9. As we saw a few slides back, the first plug-in hybrid prototypes in the U.S. were conversions built by AC Propulsion in San Dimas, near Anaheim, and at the University of California at Davis.

And finally, as David Letterman might put it, here's the Tenth and Final Reason Why California Can Lead the Nation to Plug-In Hybrids:

10. We have Hollywood! America loves to watch celebrities, and every couple of weeks we get new and free "endorsements" of hybrid cars from stars such as Cameron Diaz, Gwyneth Paltrow, Bill Cosby, Ted Danson and others who've traded in their Bentleys and SUVs for hybrids.

So how can we make this happen?

The California Cars Initiative (calcars.org) originated in response to local interest in plug-in hybrids, support from current owners of all-electric vehicles, and the realization that Californians have the buying power and resources needed to jumpstart this market. (SLIDE 12: WHAT PEOPLE ARE SAYING ABOUT PLUG-IN HYBRIDS & CALCARS)

Our goal is to educate about plug-in hybrids and demonstrate consumer demand for them, find ways to bridge the cost/"vision" gap, and bring them to market in partnership with auto makers

CalCars is a group of entrepreneurs, environmentalists, engineers, and other citizen volunteers -- mainly in the Bay Area -- who saw the need to organize potential plug-in hybrid buyers in order to jumpstart the market for these vehicles.

This involves combining consumer demand with that of corporate and government fleet managers to create a "buy order" we can bring to carmakers. Following a prototype stage involving conversions, we estimate that an order in the tens of thousands could lead a car maker to offer a plug-in hybrid option on one or more of their existing or currently planned models. (SLIDE 13 PLATFORMS WE'RE CONSIDERING FOR CONVERSIONS) calcars.org is a non-profit that's organized like a start-up -- with a lean, decentralized team of key players, advisers and supporters. We're working on developing specific cost and performance projections for different configurations, finding donors and sponsors, and assembling potential buyers of the first prototypes. I expect that some people in the audience today are in a position to help us promote this effort in ways ranging from spreading the word to others helping us refine our strategy, to exploring your institution's fleet needs, becoming an individual or institutional sponsor, or later joining our Buyers Club. (SLIDE 14: BUMPER STICKERS FOR CALCARS SPONSORS).

You can find out more at www.calcars.org (SLIDE 15 AT CALCARS.ORG), from the materials at our table, and from questions, which I now welcome!

Felix Kramer is a marketing strategist and communicator. He has a lifelong environmental background, including writing speeches on energy and transportation for a member of Congress, running a nonprofit energy conservation and alternate energy conservation services company, and directing in New York City the three-day city-wide program that was part of the 1978 national Sun Day event. In technology, he has an entrepreneurial track record with startups. He was one of the first desktop publishers and online marketers. Starting in 1997, he founded, raised money for and ran a Palo Alto-based marketplace for web development services. Since selling eConstructors in 2001, the two years he's spent brainstorming with environmentalists, technology and business people, and car experts has resulted in his founding the California Cars Initiative (www.calcars.org).