



ELECTRIC VEHICLE ASSOCIATION OF SAN DIEGO (EVAOSD)

An affiliate of the ELECTRIC AUTO ASSOCIATION (EAA), 2031 Ladera Ct., Carlsbad CA 92009 Ph: 760.753.2949

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Regular Meetings: 4th Tuesday of every month (January thru November), at 7:00 pm,
Location: San Diego Regional Transportation Center, at the corner of I-15 and El Cajon Blvd.
Place: In the Autatorium
Next Meeting: Tuesday, July 26, 2005 @ 7 p.m.
Subject: Photovoltaic solar power and EV operations
Speaker: Ivan Workman, VP EVAOSC (Southern California)

The President's Message

Our 15th Annual June Barbeque & meeting was a success and it was well attended with 35 attendees. Thanks to everybody that attended and contributed with food, vehicles and donations. During the meeting we passed out 6 each flyers that EVAOSD has obtained from EAA through a donation form one of our members. These flyers (printed on 50% recycled stock with a soy-based ink) were obtained at reduced cost due to bulk printing. The flyers will be available during our public EV events as hand-outs to anyone interested in EVAOSD. The flyers can be found on the top of the following page; <http://eaaev.org/eaalinks.html>

We have several members that have renewed their dues and some that have joined our association. Thanks to Wayne Schossow & Thomas Mowry. We depend and appreciate your support through membership. Please check your membership status and if you renew at the EAA level be sure to indicate San Diego's EVAOSD as your chapter.

For our July meeting we will be hearing for Ivan Workman the V.P. of EVAOSC in Orange County. Ivan is involved in various levels supporting electric

vehicles as we have mention in our newsletter he is working on importing the Smart cars. We are fortunate to have Ivan as a speaker before he leaves for China in August.

We have been able to establish our meeting programs for August and September so we are charging ahead. In the national news and this newsletter is Paul Scott with DontCrush.com. Paul and Chelsea Sexton will be giving a presentation and the latest information on RAV4 & Ranger Electric vehicles on August 23. Then for our September 27, meeting Dr. Jim Burns and Engineering students from SDSU are bringing their Enigma a bio-diesel hybrid that achieves 80 MPG & 0 to 60 MPH in 7 seconds.

I look forward to seeing you at our meeting on Tuesday, July 26, 2005 @ 7p.m. The meeting will be at the RTC (Regional Transportation Center), [in the autatorium] located on the southwest corner of the main building.

Note: If you arrive late the building may look dark and closed for business. We meet after normal business hours in the "Autatorium" and the public is welcome to attend our meetings.

Bill Hammons, President EVAoSD

The EV Grin

"EV'ers know about the grin that someone has just after driving an EV." Here are some notes for the San Diego EV Community.

Calendar of Events:

7/26 EVAOSD Meeting; PV by Ivan Workman

7/17-27 Solar Challenge from Austin, TX to Calgary, Alberta, Canada

8/17-18 Advance Battery Technology & Power Management

8/23 EVAOSD Meeting; DontCrush.com by Chelsea Sexton and Paul Scott

8/20 EV Awareness Day; Portland, Oregon

8/27 EBEAA Fall EV Rally in Hayward, CA

9/4 NEDRA West Coast EV drag racing Event Woodburn, Oregon

9/27 EVAOSD Meeting; SDSU's Enigma (bio-diesel 80 MPG hybrid w/ 0-80 MPH in 0:07) by Dr. Jim Burns and SDSU Engineering students.

9/28 AWEA Wind Fall Symposium – La Quinta, CA

July, 2005 we are starting our third year of meetings in the Autotorium of the RTC. Thanks to Pearson Plus and their staff for the use of their facility.



It takes many people to help with our meetings during the year. With our evening meetings being after business hours Michael McCallan keeps the building open for our meetings in Judy Bishop's Eco-Center. With Kevin Taylor bringing in his lap top computer and connectors for handling our audio and visual needs during the meetings as well as the librarian position. Brad Bennett and Arthur Albright are always available to volunteer with extra help. Several of our members contribute to our monthly newsletter and we give them credit with each story. Russ Lemon handles the day-to-day treasurer and webmaster positions. Each of our members contributes with their dues and we receive several donations during the year.

If you would like to participate more with EVAOSD we would like your assistance by filling an open position or handling a position where someone is doing double duty. Fuel Good about what we can accomplish together.



7/17 - Minnesota & Mississippi Win Solar School Challenge

Taking Turns ‘- - -, _ _ _ Messages from our members . . .

Lawrence Emerson reports: Green Car Bumper Stickers from NewDream.org

Dress up those hybrids! Reply Requested

New American Dream is pleased to show off our new bumper stickers that display the slogan that won in our hybrid slogan contest: "Green Cars Today - Blue Skies Tomorrow". (See attached) We'd like to know if you'd like to increase the visibility of the hybrids in your fleet by adding our stickers to your vehicles. We are considering the phrase "Green Fleets Today: Blue Skies Tomorrow," as a sticker that could be used on the side of the door, perhaps under the identifying logo or name of your organization, or on the bumper. We hope the sticker would bring your organization lots of positive recognition and help to create a community of leading fleets!

**green cars
today**

**blue skies
tomorrow**

new
american
dream

www.newdream.org

Hybrids Threaten HOV Carpoolers' Commute

Arlington, Virg. - Hybrid owners in Virginia have experienced a boon since Virginia authorized solo driving in high occupancy vehicle lanes for the fuel-efficient cars, reports the Associated Press. This has become a source of irritation for those who make the effort and endure inconvenience to carpool for the privilege. The effort is less rewarding than it used to be, with reports of hybrids clogging car pool lanes, making them as congested as regular lanes. Lawmakers say the hybrid rule wasn't meant to clog the car pool lanes, but to encourage people to buy the cars, which are fuel efficient and have low tailpipe emissions. Normally, the federal government would withdraw highway money from a state that gave hybrids commuter-lane privileges. But Virginia has a special waiver while Congress considers allowing the states to make their own rules for hybrids. Arizona, California, Colorado, Georgia and Florida are poised to move ahead with similar incentives if the Senate passes a long-delayed highway bill. California Assemblywoman Fran Pavley wrote legislation to open her state's car pool lanes to single-occupant hybrids. She said the bill contains "numerous safeguards" to avoid replicating Virginia's woes. For example, California's Department of Motor Vehicles would limit the number of hybrids in the commuter lanes by issuing only 75,000 special decals, and they would only apply to hybrids that get at least 45 miles per gallon. Brian D. Taylor, director of UCLA's Institute of Transportation Studies, argues against linking hybrids with car pool lanes, which he says exist for an unrelated purpose: taking cars off the road. "It would be sort of like saying you should allow nurses and school teachers to exceed the speed limit because they contribute positive things to society," Taylor said. California has also used the HOV access privilege to encourage dedicated natural gas and battery electric vehicles, low and zero emission vehicles that predate hybrids, and whose cachet has taken a serious hit with the advent of hybrid technology.

Arthur Albright reports: Toyota's approach is not totally surprising.

Evidently avoiding crushing the RAV4-EV, and potentially being open to the serial plug-in hybrid, Toyota remains focused on making a profit.

Toyota is moving strongly into the "power-hybrid" market, where a very strong electric motor(s) are mated to a very strong gasoline engine to give powerful, swooping acceleration and superb gas mpg. These new pickups, while not yet plug-in, will outclass and outperform current GM muscle cars. It's very businesslike and practical strategy directed at the one market that GM has left: big pickups and SUV.

What's needed is the plug-in hybrid, and there seems to have been a sea-change (note, also, Chevron is calling for input on energy policy, <http://WillYouJoinUs.com> -- Toyota, Chevron and Panasonic are now partners on the NiMH batteries needed for plug-in hybrids). So perhaps something really good is in the wind.

The new pattern of the campaign now needs to be "PUT A PLUG ON IT!" and re-inforce the <http://SetAmericaFree.org> folks who are calling for the 500 mpg plug-in hybrid. Just takes one small step to get from the general idea of "plug-in" to "serial" hybrid, the serial hybrid can run like a real EV at freeway speeds and gets charged by an on-board small generator if the battery ever gets low. They are on the right track.

New sign: Stylized picture of a Prius, with a big plug sticking out, and the big block letters "PUT A PLUG ON IT!". For president's statements see the following: <http://www.toyota.co.jp/en/presentation/>

Paul Scott (Speaker August EVAOSD Meeting) wrote the following to EVWorld..

Don't Crush organizer Paul Scott sent out the following email to supporters of a grassroots campaign organized to protest Toyota's practice of crushing RAV4 EV's that are returned from corporate lease programs.

"During the course of a 2-hour meeting with Toyota today, the dontcrush.com negotiating team worked out the following points, which will be finalized in writing over the next few weeks: No more usable cars will be crushed- the definition of "usable" is still to be worked out.

- Current lessees shall have the option to continually renew their leases as long as the vehicle is usable, as defined by Toyota and the consumer.
- Toyota will re-examine their policy of not selling fleet RAVs and attempt to give current lessees the option to purchase their vehicles outright.
- Toyota will create a process by which RAV4 EVs deemed not salable or usable will be dismantled for parts to be used by the remaining vehicles.
- Vehicles neither re-leased nor purchased will continue to be used; they will be sold to the public, used in the Toyota corporate fleet or made available for use by non-profit organizations."

Scott asked supporters to continue to participate in dealer protest gatherings, the next slated for Saturday, July 16th at Power Toyota Cerritos, until "these steps are finalized and put in writing".

Additional news items can be found on the evaosd.com website. Due to printing and mailing cost we are limited to six pages in our published publication. Additional EV news follows the page on the internet. Send comments and/or news items that you would like to see in this newsletter to bhammon1@san.rr.com.

EVAOSD Newsletter Monthly, 6 pages, covering San Diego County and Southern California
Subscription rates: \$12.50 per year (\$15 foreign, via sea mail) Additional newsletter items can be found on the E-newsletter at evaosd.com.

EAA Current Events *Bi-monthly newsletter of the Electric Auto Association*
Subscription rates: \$39 per year (\$45 foreign), includes a subscription to the *EVAOSD Newsletter*. Please send directly to EAA using form found at membership@eaaev.org

Current subscribers have borrowing privileges for the association's video tape and publications library.

Subscribing to the newsletter is optional and is not a requirement for membership.

EVAOSD meetings are always open to any and all interested parties.

New Subscribers, please use this form to register to receive the EVAOSD Newsletter.

Current Subscribers, please use this form to send us any change in your details.

PLEASE PROVIDE ALL INFORMATION AS YOU WANT IT TO APPEAR FOR MAILING

(Please print clearly.)

Name _____
First name _____ Middle _____ Last _____

Title (optional) _____

Company (optional) _____

Address 1 _____

Address 2 _____

City _____ State _____ Zip _____

Home Phone (optional) (_____) _____ - _____

Work Phone (optional) (_____) _____ - _____

Cell Phone (optional) (_____) _____ - _____

Email address _____

Please make check or money order payable to: EVAOSD.

Send this form and payment to: Russ Lemon, EVAOSD Treasurer.



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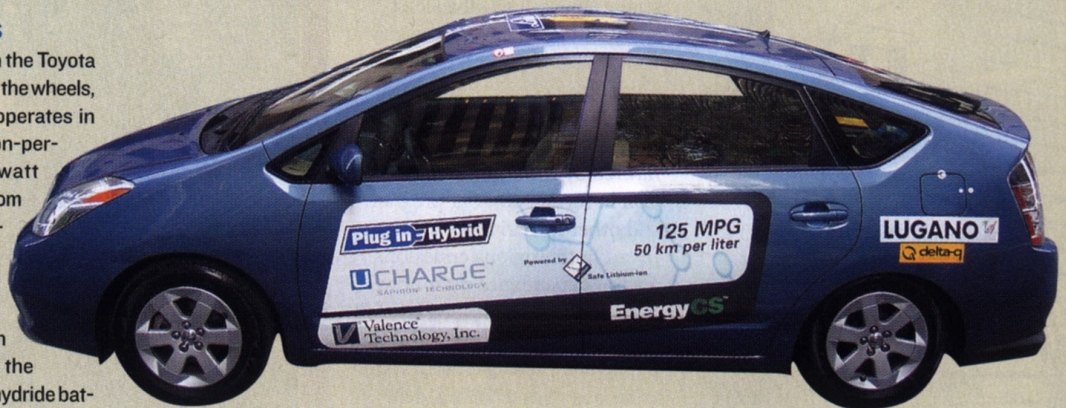
CHARGING: Makers of the hybrid-electric cars that are on the road today call them "grid independent," but making them chargeable from the grid could enormously boost their gasoline fuel efficiency.



STRETCHING THE HYBRID'S ELECTRIC CAPABILITIES

Conventional U.S.-market Prius

The motor and battery pack in the Toyota Prius deliver bursts of power to the wheels, so that the gasoline engine operates in its most efficient revolution-per-minute range. The 30-kilowatt motor can accelerate the car from a dead stop to about 65 kilometers per hour. At that point the engine kicks in (if it hasn't done so already) to keep the motor from running faster than 6000 r/min and to prevent the 1.3 kilowatt-hour nickel-metal hydride battery pack from going below a state of 40 percent charged. Even if a driver putters along at 40 km/h or slower, the car's computerized control system will activate the engine before this threshold is reached. When running, the engine shunts 30 percent of its torque back to the vehicle's 15-kW generator, which keeps the battery pack topped up. Regenerative braking captures additional energy that otherwise would be lost as heat.



Hacked U.S. Prius with Plug-in Capability

Instead of having the motor mainly deliver peak power to complement the gasoline engine, the aim is to get as much distance as possible from the electric drive train without the engine's kicking in. To keep the motor going for more than 30 km rather than just the 1 or 2 km of the conventional Prius, the hacked versions [like the Tour de Sol model, above] boast battery packs with storage capacities on the order of 9 kWh.

The battery pack can be charged directly from an ordinary wall socket, with inverters rectifying the ac current. The vehicle's control system is modified to prevent the transfer of propulsion from motor to engine at the usual speed. But with this tinkering come compromises: in its all-electric mode, when the motor and battery pack are doing the heavy lifting, the control system will not let the vehicle reach highway speeds.

European/Asian Prius

With air pollution a strong factor in Asia and Europe, the Prius version sold in those markets allows the driver to shut off the engine and run just on electricity, though the car is not a plug-in. The electric-only capability is desirable when creeping along in the central districts of cities where internal combustion engines have been banned or strictly limited at certain times. (Milan, Italy, recently ordered cars, motorcycles, and trucks off the roads on alternate days, and other cities, including London, have also taken steps to curtail automotive traffic in their business districts.)

Press a button [above], and the Prius runs just on its battery at speeds less than 55 km/h for 1 or 2 km. The electric-only setting is not locked in, however. At any speed greater than 55 km/h or with aggressive acceleration, the vehicle's control system will override the driver's selection and start the engine.

The button exists in U.S. models but is not connected to the car's control system.



Take This Car And Plug It Eager hybrid owners can't wait to connect their cars to the grid... by Willie D Jones in IEE Spectrum - July, 2005

A funny thing has happened on what U.S. policy makers thought was going to be the high road to a hydrogen economy. Initiatives aimed at putting hydrogen fuel cell-powered cars on the road by 2020-visualized by President George W. Bush in his 2003 State of the Union address as the centerpiece of his plans to wean the country from fossil fuels- are taking longer than promised. At the time of the speech, hybrid-electric cars, which offer higher fuel efficiency than regular cars because of electric motors that help drive the wheels, were seen in the United States as but a minor detour or way station en route to a world of hydrogen fuel cells.

But they suddenly are looking like the main way to go, or even maybe the ultimate destination. Models produced by companies such as Toyota and Honda are flying out of dealer showrooms. Among those who have been able to purchase hybrids (usually after a 2 to 6 months wait) are some early adopters- like a group of physics professors at Harvard University, in Cambridge, Mass.- who have made tinkering hybrids their primary extracurricular activity.

Now, a derivative of a hybrid that will improve fuel economy even more by maximizing the use of the electric motor is poised to make what is already an undeniably attractive concept downright irresistible. Some of the most eager owners of the Prius, the world's most popular hybrid, had been hacking the cars, swapping their 1.3- kWh battery packs for bigger ones with capacities as large as 9 kWh.

The modifications also include the addition of plugs so the new, bigger battery packs can be recharged from wall outlets. The resulting machines, referred to as plug-in hybrids, can be propelled exclusively by their electric motors for, in some cases, more than 30 km without their gasoline engines ever turning on. The factory built Prius can run on electricity only, but for just a kilometer or two.

This group of hackers and other technologists say that in a few years, we could have a car that, after its batteries are topped off overnight via a wall socket, could handle a daily commute using only electrons for fuel – unlike the hybrids on the market now, which still derive all of their power from gasoline.

Dramatizing the potential of the plug-in during the Tour de Sol race, a modified Prius equipped with a fully charged 9 kWh lithium-ion battery pack achieved 2.31 liters per 100 km (102 MPG) on a 240 km course. It is representative of the modified hybrids that clean-car promoters and hobbyists have been building, partly to show how wide adoption of plug-ins could lead to dramatically lower gasoline consumption and oil imports.

Because of that promise, a strange-bedfellow alliance of environmentalists and security hawks has emerged. They are united by conviction that the hybrid (not the futuristic fuel cell-driven hydrogen vehicle favored by the Bush administration in its FreedomCar program and other initiatives), is the way to cut both noxious emissions and oil dependence right now.

In a manifesto issued last fall in the form of a letter to the U.S. public and then again last March as an open letter to President Bush, a group representing foreign policy intellectuals and advocates of clean energy called for the “technological transformation of the transportation sector through what might be called ‘fuel choice.’ The group supports increased reliance on alternative fuels that are domestically produced, such as gasohol and biomass, and on cars that can draw energy from the grid.

“The United States should implement technologies that exist today and are ready for widespread use,” the group said of its core statement, “Set America Free.” In effect, the report pits a group that includes influential Republicans against a Republican president on the question of whether the country should continue to spend several hundred million dollars a year to promote far-off hydrogen vehicles when it could do more today to accelerate adoption of hybrid-electric and alternative fuel vehicles.

BOLD IN ITS VISION, the “Set America Free” report asserted that a plug-in hybrid with a 100 km range battery could cut fuel consumption by 85% and that conventional cars could be converted to run alternative fuels with the addition of control chips and a fuel-line modifications costing less than \$100 US. Combining advanced plug-in and flexible-fuel features could ultimately yield a vehicle capable of going 100 km on a mere 4.7 liter of gasoline (500 MPG), the report claimed.

The environmentalists and security-minded luminaries behind the report, such as Frank Gaffney, a senior defense official in Ronald Reagan’s administration, and R. James Woolsey, the hawkish director of the U.S. Central Intelligence Agency during President Bill Clinton’s first administration, urged Bush to commit \$1 billion over the next five years to the establishment of a domestic alternative fuels industry. In addition, they said, the federal government should implement tax credits and other incentives “to encourage rapid production and consumer purchase of advance vehicles like hybrids, plug-in hybrids and flexible-fuel vehicles and to produce “more efficient vehicles across all models.”

Eyeing the draft comprehensive energy bill, which once again is wending its way through the U.S. Congress after being stalled for two years, signers of the report are hoping that its points about hybrids and alternative fuels will make it into the final version. “There’s very little doubt in my mind that these sorts of steps will be taken at some point,” says Gaffney, founder and president of the Center for Security Policy in Washington, D.C. “The question is [do we take them] after we have realized the very unpleasant national security crisis that we’re forecasting, or do we do it in advance of that?”

Gaffney referred to what the report called a “perfect storm” of circumstances requiring that “we effect over the next four years a dramatic reduction in the quantities of oil imported from unstable and hostile regions of the world.” Other reports signers include a Regan national security adviser and a Clinton chief of staff.

THE “SET AMERICA FREE” REPORT is based on two well-founded assumptions. One is that the hydrogen economy cannot be realized for at least a couple of decades, a supposition that emerges clearly from recent reports by organizations such as the National Academy of Sciences, in Washington D.C., and the American Physical Society, based in College Park, MD. Until basic scientific breakthroughs occur, the reports concluded, the hydrogen vision will do nothing to liberate the United States from energy dependence or improve prospects for bringing down greenhouse gas emissions.

The other assumption is that U.S. consumers will be willing, even eager, to pay a premium of a few thousand dollars to get cars that are fuel efficient and environmental friendly. Sales of conventional hybrid-electric cars jumped 81% in the United States last year and are expected to double this year. These grid-independent (non-plug-in) hybrids cut carbon emissions up to 25% and smog precursors by 15%. Their gains in fuel efficiency are even more impressive: the Prius gets 50 MPG on highways, compared with the top-selling Toyota Camry’s 33 MPG, and the Prius does better in stop-and-go traffic, when the battery powers the car more of the time.

But make that car a plug-in, with batteries big enough to keep the vehicle in its electric mode for all daily errands and commuting, and the potential fuel savings become truly prodigious. Researchers have shown that battery packs offering

an effective all-electric range of 32 km will yield up to a 50% reduction in gasoline consumption. And the hope is that in a few years when advance batteries like lithium-ion become cheap enough, there will be plug-ins with an effective electric range approaching 100 km.

At that point, says Mark S Duvall, manager of technology development for transportation at the utility-sponsored Electric Power Research Institute (EPRI), in Palo Alto, CA, the car will run on electricity most of the time. Such a vehicle will use only 10% to 15% as much liquid fuel as a conventional vehicle.

Duvall points out that there's really not much difference between the systems in the conventional hybrid cars made by Toyota and Honda, or in Ford's hybrid SUV, and those that would be needed to build a plug-in hybrid. Yet the companies have not made plug-ins available and evidently don't plan to do so anytime soon.

To take Toyota, the leader of the pack: "The corporation is committed to hybrid technology, but so far [only for hybrids that] are grid independent," according to David Hermance, executive engineer at the Toyota Technical Center USA Inc., in Torrance, CA. Why? Hermance says the answer is simple: the cost of the larger battery packs is so high Toyota could never make a profit selling them at a price consumers would be willing to pay. And that's just one hurdle, says the engineer.

Hermance points out not only that the Prius-hacking tinkerer paid \$15,000 for his lithium-ion battery pack, but that the added batteries make the car heavier – by 68 kilograms in the case of lithium-ion and nearly twice that for lead acid. Thus, the car's fuel economy is actually worsened when the gasoline engine is running. And there is also the matter of having to replace the battery pack more often during the lifetime of the vehicle because cycling a battery from fully charged to 20% charged wears out even advanced batteries.

"So you have a higher up front cost, a heavier vehicle that gets less fuel economy with less performance, and the prospect of replacing the battery during [the car's] life," He says.

But individuals and groups like the nonprofit CalCars Initiative, based in Palo Alto, CA that have installed bigger battery packs and modified the electronics in the Prius have done so to show that turning the car into a plug-in hybrid is realistic.

Ron Gremban, the lead technologist on CalCars' Prius+ project, concedes that the group's modified Prius does not perform as well as it might and cost more than it would if produced by Toyota. But "a company with the resources of Toyota, Honda or General Motors could build a more elegant full-function version for far less money," he believes.

How much less is the subject of debate. Toyota's Hermance insists that, barring a spectacular breakthrough in battery chemistry, the cost of nickel-metal hydride batteries will remain around \$1100/kWh for the foreseeable future. He concedes that Prius nickel-metal hydride battery packs have become significantly cheaper since Toyota began producing the car for the Japanese market in late 1997 – power densities have gone up, allowing the car to get the same acceleration with a smaller battery pack. But energy density hasn't improved, so the energy storage remains as expensive as ever.

On this point, CalCars' Gremban simply disagrees. He claims that achieving higher power densities is much more expensive than maximizing energy storage, and he observes that with larger battery packs storing much more energy, the higher power densities are not needed. Accordingly, production-volume nickel-metal hydride batteries might cost car companies only on the order of \$500/kWh or much closer to the \$300/kWh price target, cited by EPRI's Duvall, that will make it practical for a car company to offer a vehicle with a 100 km all-electric range.

In any case, plug-in development is already in gear. Duvall reports that his organization and DaimlerChrysler AG, of Stuttgart, Germany, are currently testing four Sprinter vans built at a Daimler facility in Mannheim, Germany. If all goes according to plan, those four vehicles will be the first plug-ins to be tested on U.S. roads.

"The project has really developed nicely," says Duvall – so much so that EPRI is negotiating the final details of an alliance of utility fleet customers to fund and test another 30 prototype vehicles that will hit U.S. roads beginning next year. Asked when we'll see a Daimler plug-in in dealer showrooms, Duvall said, "If [Daimler] makes a production decision to make this vehicle, it would enter the market sometime in 2008 or 2009."