

# Charged Up



## ELECTRIC VEHICLE ASSOCIATION OF SAN DIEGO (EVAOSD)

An affiliate of the Electric Auto Association (EAA)

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### Officers:

President: Joseph S. Gottlieb

Vice President: Wistar Rhoads

Treasurer: Lloyd Rose

Program Chairman: Joseph S. Gottlieb

Newsletter Editor: Staff

Webmaster: Russ Lemon

Librarian & AV: Lloyd Rose

**Regular Meetings:** Our meetings are on on the 4th monday of every month (except December).

**Location:** California Center for Sustainable Energy  
8690 Balboa Ave., Suite 100 · San Diego, CA 92123

**Place:** Main Conference Room

**Next Meeting:** Monday, Jan. 23, 2012 @ 7:00 p.m.

**Program:** General Topics

### Presidents Message:

I had to resort to stealing! No one sent me photos of the San Diego Auto Show so I had to take one from the KickGasClub.com blog (thanks guys!). Thank you to all that went and supported that event! Especially Lloyd for taking the reins and getting it done.



I start this year off on a high note. The EV industry looks good. The auto manufacturers are building and selling EVs!. I have been (to quote an old EV friend) "living the dream" with my leaf. I am really looking forward to all the great EVs scheduled to come out this year. Hopefully, we will have some great EVents and get a lot of test drives and guest speakers. My only concern lies with the charging infrastructure that is needed. Let's hope that gets sped up. So let's make this the best year for EVs EVER!

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## From the Treasurer

always find it interesting how much misinformation is out there and how quickly it can get picked up by the “media” and other folks. The attached article helps explain an example of this phenomena and is trying to set the record straight for a local San Diego area company that has generated great interest over the years



Remember those Aptera destroying videos and we thought were maybe filmed on the day the company closed up shop but then they turned out to be months old. Here's some more context about them and information about what really happened on Aptera's last day.

Marques McCammon, Aptera Motor's former CMO, contacted us to set the record straight and sent over the picture you see above (click it to enlarge). It was taken on the last day, McCammon says, adding:

This is what the team really looked like on the day that we closed. ... We had been planning to do a group picture for weeks, but we kept postponing it support of investor meetings and strategy sessions. On Friday, when we told the team that we were closing one of the fabricators, suggested that we go through with the picture for old time's sake.

The car is in the background because several of the engineers requested the opportunity to drive it one more time before it was assigned to the liquidators. The liquidators agreed and after a few hot laps around the building, the team took this picture.

He also told us that the employees, "walked out of there with dignity and poise" after learning the company was shutting down. "The notion that we were trying to destroy assets of the company is ridiculous," he said. "There was no instance of our guys going crazy. That's simply not true."

So, what did those destruction videos show? McCammon said they were taken earlier this year when Aptera moved buildings. At the time, it was decided not to take all the bodies with them, and some were slated to be destroyed. In this process, one was dropped off a forklift, McCammon said, and engineers then continued to beat it up while taking pictures and video because they were curious to see what would happen. Some people did get a little silly, Marques admitted, but there was nothing malicious and there was no further use for those three bodies. One was a reject that the composite's team had done and the others were development vehicles that were obsolete.

How and why did the videos come to light? McCammon wouldn't speculate much, just to say that Aptera has a lot of loyal followers, people who are passionate about the company. "There are people who care about what we are doing and I think there are folks who are both positive and negative about the company and where we were going with it," he said. "I don't know why they would do [post the videos] but when people's emotions get up, they sometimes do something that defies logic."

Marques is still proud of what Aptera achieved. He made sure that one example of every generation of Aptera prototype that was built has been saved, all the way back to the very first prototype, and said that he still believes in the company's goals: "The physics of it are right, the value proposition is right for the way this country is going," he said. "I hope someone does something with it, whether it's me or the founders or whoever. If I could find an investor today, I would go and find everyone who worked in that building and put them to work tomorrow. Same mission, different name."

## IOXUS Advances Ultracaps into Wind and Automotive

*Lookout local Maxwell, the upstarts are a comin' for ya!*

The current [loxus ultracap](#) is now in use in [hybrid buses](#), [fork lifts](#), [heavy duty](#) equipment starting, backup for uninterruptible power supply applications for data centers and wind turbine pitch control, according to Ioxus founder and Vice President of Sales Chad Hall.

What all these applications have in common is they require relatively large bursts of power from a quickly and frequently recharged source. Serving that function is what distinguishes an ultracapacitor from a battery.

[Potential ultracapacitor applications](#) are much broader, probably the most important being in their potential to partner with [advanced batteries](#) to give [plug-in vehicles](#) more range.

[Ioxus](#) had a banner year in 2011. "Product bookings increased seven times from 2010 to 2011," Hall reported. In the coming year, he anticipates wind turbine applications to be 40 percent to 50 percent of sales, hybrid bus applications to be 30 percent and the remainder to be in materials handling and LED lighting.

Hall said the company foresees a 56 percent annual growth rate for the industry through the coming decade, moving global ultracap buying to \$1.16 billion by 2015 and \$7 billion by 2020. Batteries have a higher energy density but, Hall noted, "[ultracapacitors](#) have a much higher power density. Power density is the ability to deliver large amounts of power in a short time."



A flashlight, for example, could run for six hours on a battery, Hall said, and would also require six hours to recharge. “An ultracapacitor could run it about an hour and it would take 60 seconds to recharge.”

The other functional difference, he said, is cycle life. “You’re going to have roughly 400 to 1,000 cycles [of discharging and recharging] before you throw that battery away. With an ultracapacitor, you’re going to have millions of cycles.”

In a car, the first concern is miles per charge. “You would get a couple of miles out of the ultracapacitor, whereas you might get a hundred miles from a battery.” But a plug-in car’s battery pack must also provide power. Engine functions such as starting and acceleration require power, and power needs increase as a battery’s charge is drained.

“You have to be careful how hard you push a battery,” Hall said. Plug-in cars now have larger battery packs than the energy requirement would prescribe -- making the vehicles heavier and more inefficient -- because of the need for power. “The best application in electric vehicles is to use a battery and an ultracapacitor. That allows the battery to do what it’s chemically designed to do (provide energy) and allows the ultracapacitor to do what it’s designed to do, which is provide power.” In applications where the two have been paired, Hall said, increased overall efficiency allows the battery to provide “25 percent to 33 percent more miles per charge.”

This application is not presently used in cars, Hall said, because car makers have only just begun to see at what is possible in “the overall system architecture.” At car design conferences, Hall said, “Engineers are talking about it now. They’re seeing where this makes sense.” Unfortunately, real-world applications could be far off. “They’re designing year 2016 models now, so even if they started testing this last year, it would take four or five years of testing. You’re looking at 10 years.”

Today’s [sophisticated 2.5-megawatt and 3.5-megawatt wind turbines](#) are designed to be turned into the wind with precision by onboard computer systems. The 80-meter to 120-meter [long blades](#) must also be positioned to carve the fullest potential from that wind. Precise repositioning may be required very quickly by a sudden wind variation.

Ultracapacitor-powered motors do that work. “They take our 16-volt, 58-farad module. [There are] 90 of them per blade, 270 modules per windmill, 600 volts running at 30 or 40 amps. And they do that on a very high-cycle basis,” Hall said. Exerting power quickly to move the [blades](#) can drain the modules, but they can be recharged quickly with a small portion of the electricity the turbine generates.

When the much larger turbines now in design and prototype stages come to market, Hall said, Ioxus modules “will be in all of them.”

Ioxus has just brought to market its newest ultracapacitor: a 2.7-volt, 3,000-farad cell. Hall said it is improved electrically, mechanically and thermally.

“Electrically, customers are always looking for the lowest equivalent series resistance (ESR), because the lower the ESR, the more efficient the cell,” Hall said. “Electrically, the iCAP is the lowest ESR cell on the market.”

“European transportation companies agreed last year that a five percent increase in power density is big news,” Hall explained. In response, Ioxus went to work on its electrode-terminal interfaces and created a “12 percent improvement over the closest competition,” he said. “More than twice what they asked for.”

Hall said the “closest competition” primarily includes [Maxwell, the ultracapacitor industry leader](#), and NessCap, an up-and-coming Korean firm.

When asked to name the biggest obstacle to the widespread use of ultracaps, Hall replied: “Politics.”

Comparing Ultracapacitors

	Units	Ioxus	% Better than Maxwell	Maxwell
AC ESR	mΩ	0.22	10%	0.24
DC ESR	mΩ	0.26	12%	0.29
Rated Voltage	V	2.7	Same	2.7
P <sub>max</sub>	kW/kg	16.2	9%	14.9
P <sub>max</sub>	kW/L	21.2	14%	18.3
Power Density	kW/kg	6.6	12%	5.9

(from Ioxus)

The Kick Gas Car Club is taking on a new way to raise funds. Let's help promote them by passing this flyer along to anyone you know that has a Prius.

## ***PRIUS***

### ***BATTERY PACK REPLACEMENT***



Does your **First Generation Prius** (2001-2003) need new batteries? Is your fuel economy (MPG) dropping? Why not let the **Kick Gas Car Club** guide you through a simple DIY battery replacement while you act as your own contractor? At \$2,500, the cost is a little over half of what most local Toyota dealerships charge for the installation of a new battery pack. The KGCC will be installing Re-inVolt remanufactured battery packs, and turnaround is fast. Re-inVolt battery packs contain the higher density energy cells found in the Second Generation Prius. These "Gen2" cells reliably last 225,000-250,000 miles with like-new performance and less corrosion. Re-inVolt replacement battery packs come with a 12-month, unlimited miles guarantee.

See <[www.re-involt.com](http://www.re-involt.com)> and <[www.kickgasclub.org](http://www.kickgasclub.org)>.

Please contact  
Mr. Q at  
<[quevedo@cox.net](mailto:quevedo@cox.net)>  
for any additional  
information you  
may require.

# Electric Auto Association (EAA) Membership Application Form

Fill out this form, attach a check, money order or use PayPal, in US funds only, payable to 'Electric Auto Association'. CE = Current EVents newsletter

e-CE  \$35 USA & other Countries  \$25 Student  \$25 Senior (>65-USA/Canada only) birth year

paper CE  \$45 USA  \$48 Canada  \$52 World  \$29 Student  \$29 Senior (>65-USA/Canada only)

\$120 (supporting level-1)  \$240 (supporting level-2)  \$500 or more (high voltage)\_\_\_\_\_  do not list my name

I support the \_\_\_\_\_ EAA Chapter (additional chapters, \$10 each) \_\_\_\_\_

(\$10each ) Additional Chapters or Special interest group (other than the one that comes with the membership)

You can fold this form as indicated and mail it with your payment enclosed. Use tape to seal the form, **on the sides**, before you mail it or send an e-version of this form, through PayPal using <http://electricauto.org/eamembership.html>

New Member  Renewal

Name  email

Mailing address (Apt. #)  Home phone

Mailing City, State & Zip-8  Work phone

Electronic version of Current EVents, paperless only, link sent by email, if your membership was for the e-version, that is what you will receive

Do you own or  Lease an electric vehicle (plug-in)  production  conversion  bicycle  hybrid or  None

please include miles driven and type of vehicle

All information in this application is for the exclusive use of the EAA and not sold or given to any other organization.

**Please identify your primary areas of interest relating to the EAA (check as many as your wish)**

Owner/Driver  Hobby/Builder  Professional/Business  Competition (Rallies, Races, Records)  Plug-in Hybrids

Environmental/Govt. Regs  Social (Rallies, Shows, Events)  New Technology & Research  Solar & Wind Power

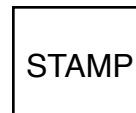
Promotion & Public Awareness of EVs  Student or General Interest  Electrathon/Bicycle/Scooter/Other

The Electric Auto Association is a non-profit, 501(c)(3) for the promotion of electric vehicles. Your donations are tax deductible and with your membership you will receive the EAA publication, "Current EVents". All information and statistics in this application are for the exclusive use of the EAA and is not sold or given to any other organization or company. Your membership dues include a percentage goes to the EAA Chapter you support for public Electric Vehicle promotion EVents like rallies, shows and EV rides.

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 make check or money order payable to: EAA and reference EVAOSD. Send this form and payment to: Lloyd Rose, EVAOSD Treasurer; 2755 Dos Aarons Way, Suite A, Vista, CA 92081

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