

**Fox Valley Electric Auto Association**  
PO Box 214  
Wheaton, IL 60187-0214

Return Service Requested

Monthly Meeting: **Friday, July 17th, 2009 - 7:00PM** (doors open at 6:30PM)

Meeting Location: **Packer Engineering, 1976 N Washington St, Naperville, IL 60563**

Directions: Packer Engineering is the on East side of Washington St, just North of the I-88 Tollway (North of Diehl, South of Warrenville Rd). Turn off of Washington onto Bighorn at the Packer Engineering sign, then take the first right into Packer Engineering and then an immediate left. Park in the lot between the buildings. 1976 is the new building up the hill. Enter the building in the middle of the North side.



## July 2009 FVEAA Newsletter

The FVEAA is a Not-For-Profit Illinois Corporation and the Chicago Area Chapter of The Electric Auto Association

### Meeting Agenda

#### **Business:**

Call to Order and Introductions  
Old Business  
    Committee Reports  
New Business  
    Any other new business anyone?

#### **Intermission:**

EV Viewing, Networking & Raffle Tickets

#### **Program:**

##### **The GM Ahead**

Rich Gunther, GM Fleet Account Executive - Government & Alternative Fuels, will share his knowledge and expertise of where GM is going post-bankruptcy and on into the "greening" of the auto industry. He will give us updates on the Volt, GM's electric car, and the other alternative fuel vehicles that GM is working on.

A scant few years ago, Auto Blog launched Auto Blog Green. "In the early days", they would post articles perhaps twice per week. Zoom forward 3 years and WOW... you'd have to read their articles for an hour daily to keep up. I don't know if it's any easier being green, but it certainly is more common. Interesting times to be alive and driving electric!

**Newsletter Editor**

*Nathan Stowe*

First, thanks to James Zukowski for his service as newsletter editor in the last year. I will be assuming the role of FVEAA newsletter editor.

Deadlines: I would like to have all articles for the newsletter submitted by the first Friday of the month. I will attempt to have the newsletter ready to send out during the second weekend of the month, which leaves one week for our members to plan to be at the next meeting.

New Topics: I would like to try to have more content for the newsletter. If anyone has suggestions or articles they would like to submit, please let me know.

Independence Day EV Sightings: Please send details and pictures of the EV's which were in parades or car shows.

Current Conversions: I would like to have a section featuring the conversions in progress by all members of our organization. This section would touch on both the technical and personal aspect of a conversion. This section will require information from individual members like you. If you are converting a vehicle (business or personal), please let me know. I would like to report on the vehicle, components, vendor(s), why each was chosen, and finally why you (or your client) feels that it is important to drive an EV.

If you wish to contact me regarding an article for the newsletter, please do so via the FVEAA forum, or call me in the evenings at (773) 456-6322. - Nathan.

**Membership Update**

*Ted Lowe*

We're **215 members strong**, 4 new in last 2 months! **BIG WELCOME** to:

Bruce Jones - Naperville, IL

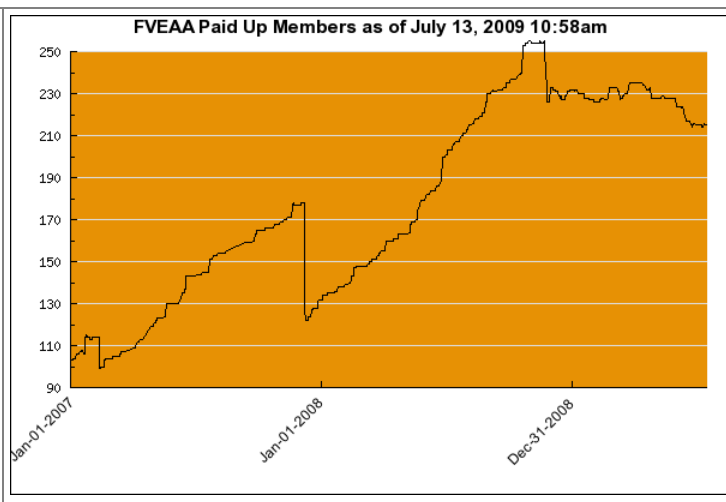
Mike Mastrangelo - Highwood, IL

Al Snook - Geneva, IL

Kenneth Orr - Chicago, IL

Many renewals are up now since it's been about 1 year since the \$4+ gallon gas of the summer of 2008. **Newer members, please renew!**

It will be interesting to see how this graph plays out this summer!



## 1990 Electric Nissan Sentra For Sale



126 volt system, heater, rear window defogger, new tires in front, all new struts with upgraded rear springs. Has a 9-inch DC Warp motor sold by John Emde. DC to DC converter. 144 Volt Curtis Controller. Factory Manual included.

Tow hitch and tow bar included. Two-tone, Top panels painted, lower panels rust proofed, inside and outside.

Upgraded a couple of times - upgraded from original 8-volt batteries to 6-volt 125 Trojan batteries in May 2006 - heater added to the OEM duct work.

Driven daily 25-35 miles. Longest one day drive was to the FVEAA meeting in Naperville, 99 miles round trip with a 4-hour opportunity charge while in Naperville. Has 25,000 electric miles. I am the second owner. **Make me an offer I can't refuse! -- George Gladic**



### Comparison of Battery Chemistries

*Rich Carroll*

Wayne Cunningham in the Cartech Blog reported on a table which compares battery chemistries. The page was written by Mike Thompson.

Page under development. Surprised? These numbers are gathered from multiple sources under different conditions. So comparisons are difficult at best and any actual comparison should use proven data for a particular model of battery. Batteries perform differently due to different processes used by different manufacturers and different models from the same manufacturer will perform differently depending on what they are optimized for. The actual application will dramatically affect a battery's performance and the choice of battery.

| Technology                    | Density |        |       |        | Cycle life to 80% DOD | self discharge %/month | maturity    | cost    |        |                    | Range* +-50% km | unique features  |
|-------------------------------|---------|--------|-------|--------|-----------------------|------------------------|-------------|---------|--------|--------------------|-----------------|--|
|                               | energy  |        | power |        |                       |                        |             | current | future | environmental      |                 |  |
|                               | Wh/kg   | Wh/l   | W/kg  | W/l    |                       |                        |             | \$/kWh  | \$/kWh |                    |                 |  |
| Flooded lead acid             |         |        |       |        | 600                   | 20                     | mature      | 100     | 100    | low with recycling | 96              | modest performance lead                                    |
| Advanced lead acid            | 35      | 71     | 412   | 955    | 500                   | 5                      | production  | 150     | 100?   | low with recycling | 160             | high performance lead                                      |
| Nickel Cadmium                | 50      | 150    |       |        | 2000?                 | 100                    | mature      | 300     | 300    | high cadmium       | 200             |  |
| Nickel Metal Hydride          | 80      | 200    | 220   | 600    | 600+                  |                        | production  | 1000    | 200    | low                | 320             |  |
| Nickel Zinc                   | 60      | 100    | 500   |        | 600                   |                        | laboratory? |         |        | low                | 250             |  |
| Lithium Ion                   | 100     | 300    |       |        | 1200                  |                        | laboratory  |         |        | low                |                 |  |
| Lithium Polymer (3M)          | 155     | 220    | 315   | 445    | 600+                  | 1000                   | prototype   |         |        | low                |                 | pack in body panels saving space!                          |
| Lithium Polymer (Electrofuel) | 183     | 470    |       |        |                       |                        | production  |         |        | low                |                 | pack in body panels saving space!                          |
| Lithium Polymer Potential     | 400     | 500    | 1000  |        | 600+                  |                        | laboratory  |         |        | low                |                 | pack in body panels saving space!                          |
| Sodium Nickel Chloride        | 90      | 150    | 100   | 200    |                       | 400                    | prototype   |         | 300    |                    |                 |  |
| Zinc Air                      | 200     | 200    | 100   | 30     |                       |                        | prototype   | 300     | 100    | low                |                 | Recharged by Zn electrode replacement                      |
| Flywheel                      |         |        |       |        |                       |                        | laboratory  |         |        | low                |                 | Mechanical!  |
| Ultra Capacitor               | 12      | 5      |       | 10**8  | 10**8                 |                        | laboratory  |         |        | low                |                 |  |
| Vanadium Redox                |         | &nbsp; |       | &nbsp; |                       |                        | laboratory  |         |        |                    |                 | electrical or mechanical recharge by replacing electrolyte |

\* - Range values are HIGHLY dependent on aerodynamics, battery mass, vehicle mass, drive train efficiency, weather, tires and other factors. Consequently, a highly optimized state of the art vehicle can easily get 2 to 3 times the range of a vehicle not optimized for range for a given battery technology. The range numbers are included to give a relative feel for the battery technology without having to derive it from energy density. The range assumes an efficient vehicle with good aerodynamics in the 1000 kg without batteries sedan range driven on dry pavement using some energy conserving driving habits. Conversion factors: 1km = 0.62 miles, 1 mile = 1.6 km

Data are optimized, independent values. For example, when testing for peak power ( power density ) energy is removed from the battery so fast that it may only have 10-50% of it's capacity. When testing for capacity ( energy density ), the power levels are lower to get a higher capacity.

Data extracted from hear say, manufacturers, and [EE Times](#).

Some of the data is from small cells like AA bateries. Data for EV batteries is used where available.

Data is selected to reflect higher density battery implementations without going into astronomical cost premiums.

Data reflects the electric vehicle market. Ie. NiMh batteries are in production for portable electronics but are in a prototype stage for electric vehicle size batteries.

Depending on the technology, state of development, production volumes and size of battery cell these numbers can easily vary by +-50%. Cost in some cases may be off by a factor of 10 or more as laboratory or prototype batteries move into high volume production.

This page is located at:<http://www.madkatz.com/ev/batteryTechnologyComparison.html>

For questions: [m.t.thompson@ieee.org](mailto:m.t.thompson@ieee.org)

## iPhone in your EV!

*Rich Carroll*

I find it very interesting when two somewhat new technologies meld together. For those of you with iPhones, there is an interesting iPhone app named Bliss Trek. Bliss Trek is a 99 ¢ program that needs you to mount the phone on a level surface, and drive your EV. Bliss Trek keeps your speed, trip time, and your acceleration and deceleration. It rewards smooth driving, and tells gives a visual indication of how energy efficient your driving is. I do not recommend trying to enter data while driving, but to have this mounted to your EV and occasionally view the readouts is not unsafe. OK, it's PROBABLLY not unsafe, unless you get mad at the results, and ...

## Costs of Energy

*Matt Remec*

Here is some food for thought about our most common energy sources.

| Energy Source                   | US \$/Million BTU |
|---------------------------------|-------------------|
| Natural Gas                     | \$2               |
| Electricity (for heating water) | \$35              |
| Gasoline/Diesel                 | \$13              |
| Coal                            | \$0.50            |

## New Products in the Pipeline for EV's

*Rich Carroll*

Several new products have been introduced recently for EV's and not all of them have been widely publicized. Let's break this down by major groups.

**Motor Controllers** Some of you know that the Logisystems controllers have been re - re-engineered again. It that statement sounds redundant, it is not. Originally, the Logisystems controllers relied on a 0-5K potentiometer (a.k.a. 5K Pot Box) most commonly a Curtis PB-5 (or with a microswitch added, a PB-6.) The early Logisystems controllers had a rather abrupt onset, and this was traced to the pot boxes. Bench testing showed the pot boxes went from 0 ohm to 250 ohm with a slightest movement of the control, then perhaps to 180 with another very slight movement, and then 450 ohm with another slight movement. Setting aside the first Curtis Pot Box and trying another might produce 0, 150, 450, 377 ohm readings as the smallest advances were made. Note the advances were not linear at all, and sometimes illogical. Logisystems found it very difficult to reverse engineer their controllers to allow for this, and subsequently have redesigned the 0-5K pot box to be a potentiometer with a wider physical sweep, a gear reduction, and higher quality than existing units. This meant that the Logisystems controllers had to be reengineered several times as the control units changed. Logisystems has been exceptionally good about updating their controllers for no additional charge, and the new units are extremely smooth. We applaud Logisystems for their extreme diligence in producing a controller that everyone will love.

At least two other major players are close to producing high voltage, high amperage controllers to fill the void left when the Zilla controllers stopped production. One of these is made by Logisystems (although branded differently), and we at Pioneer believe this will be the high end controller to beat. The other is made by Kelly, who is now making controllers up to 156 Volts and 1200 amps. As we see more of these new controllers, we'll keep you posted on how they seem to work out.

**Chargers.** Zivan has introduced a new line of Power Factor Corrected, High Frequency chargers, and they all appear to be dual voltage input. They come in 1500 W, 2000W, 3000W and 4000W, and are perfectly happy with either 110 volt or 220 volt input. Their early chargers have shown some growing pains, but their years of quality chargers would indicate that they can straighten out their early confusion.

Another major company is also planning a high wattage, dual voltage charger to be introduced within the next month or so, and we will make you aware of these chargers and their specs when they are introduced. Since this company already has a very strong reputation for extremely high quality, well designed EV parts, we are anxious to see their charger. If you want, send me an email and I'll send you

a new product announcement on the first day they are available.

Iota **DC/DC converters** all come with a dual voltage plug, and all the units we sell now have a relay attached to make this a useful feature. With the relay wired as we suggest, the pack voltage is converted to 13.6 volts for the 12 volt car system when the key switch is off, and converted to 14.2 volts when the key switch is on. This prevents overcharging the system battery, but allows for nice bright lights, crisp windshield wipers, reasonable sequenced turn signals, etc.

In addition, we have found a line of **plastic boxes** to help shield some of the underhood components from dirt and debris. Packing relays, contactors, electronics and fuses in a semi sealed box reduces service concerns on these parts. Stop and see one of our recent conversions to see how this works.

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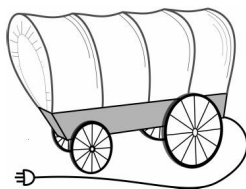


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Please check one: New Member \_\_\_\_\_ Renewal \_\_\_\_\_

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The FVEAA offers these types of memberships (please circle your choice):

|                  |        |
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**TOTAL DUE:** \_\_\_\_\_

Please make your check payable to "FVEAA" and postal mail it with this membership application form to:

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**PO Box 214**

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Attn: Membership