

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

Return Service Requested

Monthly Meeting: **Friday, November 20th, 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.



## **November 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 -  
Updates and Excitements  
New Business

#### **Program:**

- 1) Listing of Chicagoland Charging Stations**
- 2) Big Windy Report (Wind Turbine at Schiller Park Restaurant, the Great Escape) - Todd Dore**
- 3) A "Greener" Food Bank - Bruce Jones**
- 4) Controller Comparison - Rich Carroll**
- 5) For the motorheads among us, a fun game!**

**Intermission** - Raffle tickets, refreshments, EV viewing and networking

## Meetings

Effective with the November meeting, **it is imperative that everyone be out of the building by 9:45 PM, due to automatic setting of the alarms. This means the programs will formally end by 09:30** to allow us to get people and EV's out of the building. As usual, doors open at 6:30 and meetings start promptly at 7:00. I feel we are extremely fortunate to have a meeting place such as Packer which gives FVEAA several things that are very difficult to obtain and necessary for our group. Additionally, the Packer employee who stays to open the doors and accommodate us is not paid by Packer or FVEAA, they simply do it for good public relations. These folks are wonderful to us, and we can't find enough ways to say thanks.

## Grants and Programs

Several recent stimulus grants have been announced, and these will certainly affect both members and the EV community as a whole.

1. In late October, Naperville was awarded a Smart Grid Investment Grant. Only one such grant was made in Illinois, and it provides \$10,994,000 to **deploy more than 57,000 smart meters and install the infrastructure and software necessary to support and integrate various smart grid functions and the two-way flow of information between the utility and customers.**
2. The City of Chicago has appointed a committee for the Chicago EV Consortium, to make suggestions for build out of a charging EV charging grid in Chicago. **One of the Co-chairs of this committee is an FVEAA member, and two other members of the FVEAA Board of Directors are committee members on CEVC.** This is in conjunction with the City of Chicago, Department of Environment's Chicago Area Alternative Fuels Deployment Project. The project will deploy 554 alternative fuel and hybrid electric vehicles and install 153 alternative fueling and electric vehicle charging stations throughout the Chicago region. The initiative also includes garbage trucks, also known as refuse collection vehicles. The project will result in expanded availability of alternative fuels with 17 new CNG and E85 fueling stations and 63 electric vehicle charging stations. DOE estimates that the project will help displace 3 million gallons of petroleum per year. That award from the US Dept. of Energy is \$14,999,658
3. There are rumors of another state award of approximately \$50 million to for the development of alternative fuel vehicles within Illinois.

This could truly become an exciting time, but you will have to remain informed as you navigate through the various proposals. (Hint: we'll try to keep FVEAA members fully informed, so please keep you membership current)

## Conflicting Business Models for EV Charging in the Chicago Metro Area

Unfortunately, there is still significant division among various business models for EV charging stations. Apparently, not much has happened to consolidate this problem. To

summarize, several ways are available for EV's to charge while away from their home.

1. Commercial businesses who will let an EV charge, usually at 110 Volts, while the driver/passenger shops or dines. Usually the business will provide electricity for recharges for no charge. Most connections of this type allow up to 10A current at 110 V. (Any outside receptacles for 220 V are not NEDA compliant for safety, except for AVCON and J-1772 connections.) This may become more prevalent, as the Low Speed Vehicle laws take effect in Illinois after 1/1/10. Low speed vehicles are most commonly recharged at 110V.
2. AVCON outlets at some churches, train stations, parking areas, and commuter terminals are 220Volt charging points up to 30 Amps. These also provide no charge electricity for the EV owner. The cost of the equipment for an AVCON connection may be covered by a special fund of the FVEAA and EAA. The installation cost, and the electricity cost will need to be born by the property owner. (Avcon outlets meet the older standard, SEA J-1772-2001)
3. Coulomb Technologies sells low voltage (and proposes high voltage) charging points for EV's in Illinois. The business tho puts a charge station in will be charged for the equipment, and may elect to charge the EV owner for KWhr used, for connection, or by the hour. For EV drivers to benefit, they have to have a credit card on file, and an account with Coulomb. Coulomb did make a proposal to FVEAA members over a year ago, and offered to sign members up for the balance of 2008 and all of 2009 without monetary charge. Unfortunately, with the exception of one Downtown Chicago garage in Millennium Park, they have not added any new public Illinois charging points. I have written asking for information about planned expansion, but have not received any answers. It is unclear what Coulomb will do with the FVEAA members accounts after the 2009 year ends. Coulomb has the option to charge EV drivers a monthly fee, even though their only public access points are in the Millennium Park garage. Coulomb has shown 110 V 10A terminals in the Chicago area, but have announced J-1772-2009 terminals in California, although no amperage has been announced.
4. There are efforts to add J-1772 charging points for the Tesla drivers who have chosen to use the J-1772 connection. J-1772 (technically called SEA J-1772-2009) connections may be configured to handle up to 70 amps at 220V in the US, and up to 400V in Europe.

An EV owner who depends on an opportunity charge may need to carry various adapters and connectors to allow use of more than one type of charging station. I can charge three ways in my EV, and plan to carry adapters for one or two more. I have an AVCON receptacle, a 110V plug and a 220V plug in my S-10.

## Controller Comparison

*Rich Carroll*

Several new electric vehicle controllers have been introduced or are are about to be introduced into the market, and I thought it might be a good idea to chronicle the differences in several controllers that are among the common choices for EV users. First, let me confine my discussion to DC controllers for this month.

	<b>LogiSystems®</b>	<b>Raptor®</b>	<b>Curtis®</b>	<b>Solitron 1 ®</b>	<b>Zilla®</b>	<b>Warp-Drive®</b>
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Voltages	72-120V, 120-144V*, 144-156V*	up to 156	up to 144*	300V(actually up to 342V)	up to: 156V*, 300V*, 348V*	up to 160V, 260V, or 360V, may be upgraded later
Amperages (Continuous)	550 Amp*, 750 Amp*, or 1000 Amp*	1200 Amp	up to 500 Amp*, up to 550 Amp*	1000 A liquid cooled, 1400 A w/ racing agreement	1000 Amp*, or 2000 Amp*	Up to 1000, 1200 or 1400 A*
Main Connects	End	End	End	End	End	Top
Throttle input	Special Pot box (0-5K) (included with LogiSystems)	0-5K Pot	0-5K pot	0-5+V source, or Hall effect. May use Curtis type pot box if pot box is rewired with pullup resistor	Hairball can be wired for either Pot Box, or Hall Effect Pedal at time or order	Hall Effect
Other Inputs	none	none	none	<b>Tach Brake and Reverse input</b> , can limit overspeed, or idle motor for Auto. Trans.	Tach input	<b>CAN bus</b> , none yet, but planned.
Style of Lo Amperage Connects	1/4 inch spade terminal	1/4 inch spade terminal	1/4 inch spade terminal	Screws on terminal blocks, covered	Hairball with screw clamping terminals	Automotive type push on
Key Switch Interface	Needs Pack Voltage	Needs Pack Voltage	Needs Pack Voltage	12V only	Uses 12V signal from key	Uses 12V signal from key and start circuit
Need for precharge resistor	Not essential. Suggested by some.	No	Yes, not included	Built in	Built in.	No
Additional interface	No	Ttrigger of main contactor. Remote display avail.	No	3 programmable outputs for driving 12V nominal and < 1A	Tach sensor output and other functions in Hairball	CAN bus, data logging, tach , pack V, motor/ batt A, controller temp, and more.
Cooling	case heat sink and fans	Air	case heat sink	Liq. suggested, or high amp. draws time limited.	Liq. Cooled, not included.	Liq. Cooled, not included
Absolute maximum wattage	<b>156 kW</b>	<b>187 kW</b>	<b>72 kW</b>	<b>&lt;≈342 kW **</b>	<b>696 kW</b>	<b>504 kW</b>

Maximum Wattage of Common unit	<b>117 kW (156V 750A)</b>	<b>187 kW</b>	<b>72 kW</b>	<b>&lt; ≈ 342 kW</b>	<b>156 kW</b>	<b>160 kW</b>
Power reduction with higher controller temp.	No	No	No	rate of 2.5%/°C above 55°C	Yes	Yes
Silent Operation	Quiet fan noise	Yes	Controller whine at low throttle	Adjustable 'whine' to inaudible, very quiet	Quiet fan and pump	Quiet fan and pum
Retail Price	\$1,200 - \$1,800	\$2,600	\$1,400 - \$1,600	\$3,275	\$1,975 - \$5,075	\$1,950 - \$4,350

® All Controller names are Trademarks of their respective owner (LogiSystems, Peter Senkowski, Curtis Instruments, EVnetics, EVComponents, and NetGain Controls).

\* Indicates options available which must be specified on original order

⌘ Indicates options available which may be specified as upgrade by dealer

\*\* Full current of 1000 Amps available only through 200V. "Slight derating above that"

## Discussion

The Curtis line of controllers is a well known, commonly used controller, but with very modest performance for normal sized cars and small trucks. It can be useful in limiting the energy used per mile, as it cannot deliver huge amounts, and therefore might be useful in achieving maximum range. The Raptor controller is a durable unit, but does not have the newer interfaces, and must be used with a 0-5K pot box. It appears to be priced with competitors with many more features.

The LogiSystems controllers are a great controller, placed inbetween the high end Zillas and WarP-Drives and the lower cost Curtis line. These LogiSystems are well built, very reliable, and have reasonable cooling to keep them operating smoothly. They are available as LogiSystems branded with plain aluminum cases, or as WarP-Core branded with anodized red cases.

At the upper end of the controller spectrum (in price and in performance) are the Solitron 1, the Zilla and the WarP-Drive. All are realistically liquid cooled, available with at least 1000 amps, and in higher voltages for better performance. All can have extremely quiet operation, with only the very quiet fan and quiet cooling pumps audible if the area is open to the listener. If they are in a closed area, like a closed hood, the fan and pump are not audible. The Solitron 1 has a minor controller whine, but this can be eliminated by changing the frequency to an inaudible range, with a very small loss in power. (OK, so I am hearing impaired, I can't hear them, even with a hearing aid.)

Both the Zilla and the WarP-Drive can be purchased with upgrades for higher voltages and for higher amperages. The Zilla needs to be built with the higher voltage or amperage in mind, where the WarP-Drive can be upgraded by the dealer through software. It is somewhat comforting to know that the base WarP-Drives are built with much more capability, and are only needing a software 'unlock' to have more power run through it. The purchaser knows that the physical build of the WarP-Drive already has the upgraded components inside the case. The Solitron 1 can be increased from 1000 amps to 1400 amps for racing ( and used for short periods only!) This requires manufacturer's approval of

a special racing application, and acceptance of a special racing warranty.

Zilla low amperage connections are made through a Hairball, which can be purchased in pot box compliant form or in a form to take a Hall Effect sensor. Hall effect sensors have better longevity, but are somewhat more costly at first. The WarP-Drive can only be controlled by a Hall Effect sensor, either a pedal or a pot box replacement. WarP-Drive low amperage connections are made with water resistant, automotive type, plug in connectors. Solitron 1 low amperage connections are made by screw in connectors on a terminal strip behind a plastic cover.

The Zilla's Hairball has some interface for tachometer sensors, and is extremely configurable, although the basic configuration, as shipped, is close to a perfect compromise on settings. The WarP-Drive has less ability to change configurations settings, but only the most advanced user will miss this. The WarP-Drive has several signals on an industry standard CAN bus that can be extremely useful. Current information on the CAN bus is a battery amps, motor amps, system voltage, controller output effective voltage, controller temperature and more. Future implementations will have GPS abilities, tachometer and speedometer output, battery state of charge, etc. Solitron has an ethernet port for data logging, built in web browser interface for settings and updates (only in Windows with DHCP turned on) Other computer configurations (Windows without DHCP, Mac, Linux) may be used with several system setting changes.

## **Meeting Minutes**

*Bruce Jones*

**Friday October 16th, 2009** -doors opened at 6:30pm, meeting started at 7:00 pm.

Rich Carroll offered a sincere thanks to retired president Ted Lowe.

### **SHORT COMMITTEE REPORTS**

In order to keep our monthly meetings to a reasonable length committee reports will be submitted to the newsletter.

### **LEGISLATIVE COMMITTEE - Todd Dore**

Howard Hansen, who has been fighting to keep special Electric Vehicle license plates for electric vehicle owners in Illinois had his case thrown out because the officer did not show.

### **FINANCIAL ASSISTANCE - George Vergara**

George is proud of a recent project to register the FVEAA with a Data Universal Numbering System (DUNS), which is an identifying number for over 100 million businesses worldwide. We now have 4 more steps to go and George is looking for volunteers.

### **OUTREACH - Rich Hirschberg**

It was noted that Rich Hirschberg needs to be added to the FVEAA directors list, as director of Outreach, and a motion was made by Dale and accepted.

### **TREASURER (and WEBMASTER)- Ted Lowe**

Ted thanked Dale Corel for his previous 18 years of dedicated service. Ted is working to complete the turnover process. Ted needs assistance with Web site programming so please see Ted Lowe if you can help in this area.

### **MEMBERSHIP - Ted Lowe**

Ted is looking to implement some changes in the FVEAA.org web site with committee information. Ted is considering a Web based system to bring tracking under control.

### **PRESIDENT**

Rich encouraged newbies to help the club, jump in, be involved and get connected in person and on the forums to the other members. The FVEAA wants to show new members how to put electric cars together, provide education and help the community.

### **NEW BUSINESS**

Todd Dore made a motion regarding charging station infrastructures. The motion did not pass and the infrastructure committee needs to get together to review the rules, assign roles as well as clarify the definition of a "public station" since there seems to be differing opinions.

### **BREAK**

There were 3 vehicles at the break and Miodrag Zubic helped install new controller software in Ted Lowe's Chevy S-10 electric truck. The raffle generated \$59

Rich acknowledged George Hamstra in the audience and called him the glue behind the NetGain conglomerate – from NetGain motors and EMIS systems, to controllers and chargers and a long time sponsor.

### **Lithium-ion battery Presentation**

Thomas D. Kaun president of InvenTek Corporation gave an outstanding - thorough technical - presentation on advanced Rolled-Ribbon Lithium-ion battery technology.

Rich closed the meeting around 10:00 p.m.

## **Outreach**

*Rich Hirschberg/Nathan Stowe*

### **October Fest, SAE, IEEE, FVEAA – October 20th, 2009**

FVEAA was promoted at the joint meeting of the Chicago chapters of the Society of Automotive Engineers (SAE) and IEEE Electromagnetic Compatibility (EMC) Society. The meeting was held at Elite (EMC and Environmental Stress Testing), in Dowers Grove. It was attended by one hundred and fifty people or so from the two societies. It was quite a fun event and generated much interest in FVEAA and EVs in general. During the social hour Nathan's eRX-7 was on display which generated much EV related discussion. It was interesting to see the facilities used for the EM testing, such as the largest electromagnet you have ever seen, and a copper shielded room the size of a gymnasium. We were given time to address the group before the main presentation and an invitation was extended to all to join our monthly meetings. Steve Laya from Elite is pictured below.

The main speaker was Emad Isaac, from the Morey Corporation of Woodridge Illinois. He gave an excellent presentation about telematics and Morey Co's design, development, testing, validation and manufacturing of ruggedized electronic assemblies. It was quite ironic because Emad was at our last meeting. Hopefully he and others continue to join us.

### **Cruise Night at Nanners Grand Opening – October 24th, 2009**

It was a dark and stormy night... oops, wrong story. Actually it was a nice night - great for a cruise night. But where were all the hot rods, modifieds, and antiques? Seems only the EVer's had enough guts to hang around. A few ICE cars showed up but left after a little while. Todd Dore and Mike Mastrangelo (and Susie) were the dedicated ones, but for Todd it was quite a journey. While he was recharging at Ted's house in Wheaton, he and I discussed the charging opps at Nanners Beef. It seems Todd could make it to the

restaurant, but that's about it. After the typical crisis of where to plug in, the guys were able to connect to a generator.

Mike Mastrangelo and Suzy brought their Zero motorcycle - what a trip; I mean both figuratively and literally. Mike had a number of people come up to him and ask about the Zero. I think one guy in a pick-up even tried to buy it that evening. After I got free from the activities, I hopped on and cruised around the parking lot twisting and turning and accelerating like a crazy man... but it was a blast. And it was so quiet! Did I say quick? IT WAS QUICK! I just wanted to find the parking lot exit and keep going; I'm sure Mike wouldn't have minded (right Mike). Boy do I need one of these things, but where do I put the wife and kids?

After eating some of the excellent food inside the restaurant and sharing in some good conversation, we decided to call it a day. I think Mike made some good contacts and I know Todd got to share some of his EV story to non-EV people, so in the end, we did our part to further expand the EV Universe. As Dory would say in "Finding Nemo" - "Just keep grinning, just keep grinning." I know I had the EV grin that night!!!

### **Unique Hybrid Electric Truck Donated to Local Food Bank - Needs FVEAA Member Action**

*Bruce Jones*

**New Community Counseling and Ministries** is a nonprofit, 501(c)(3) faith-based organization with a special focus on finding ways to serve the basic needs of people in crisis. One service they perform is the operation of a food bank called "Food Thing Network" that collects fresh fruit and vegetables for 60 - 80 needy families in Naperville, and other areas of the western suburbs. It's a "Greener" food bank. (See [www.FoodThingNetwork.org](http://www.FoodThingNetwork.org) or [www.NewCommunityMinistries.org](http://www.NewCommunityMinistries.org))

#### **Why a "Greener" Food Bank?**

To reduce waste! Thousands of pounds of fresh fruit, vegetables and meat go to waste in northern Illinois using the current centralized food pantry model. Perishable and non-perishable food items are donated by retailers in 13 counties in northern Illinois (excluding Cook), then shipped to a warehouse in St. Charles, Illinois. From there, the food is sent by trucks and vans back out to food pantries.

Food pantry directors have reported that due to delays in shipping back and forth, the condition of the fresh food is often "wilted or near spoiled" and must be thrown away! One mission of the New Community Ministries is to distribute fresh food quickly by decentralizing the operation, so food stays fresh within the local area and is not wasted. The produce is collected from local retailers and temporarily stored and cooled in local neighborhoods. The fruit and vegetables are then picked up by needy families or picked up by "neighborhood captains" for fast distribution

#### **So what does all this have to do with the FVEAA??**

The food bank has been praying and searching for an electric hybrid truck to help move the perishable food in an eco-friendly way that's better for the environment. **NetGain Technologies, LLC** is a local company that has developed hybrid electric technology to retrofit light and medium duty trucks for more fuel efficient performance. Check out <http://www.netgaintechnologiesllc.com> and this awesome video on their Grumman-Olson hybrid Step Van <http://www.youtube.com/watch?v=VfP-vBfXreg>

### **HYBRID ELECTRIC STEP VAN**



NetGain recently completed field testing of that hybrid electric test vehicle. Having heard about the food bank needs, NetGain Technologies will generously donate it to New Community Counseling and Ministries! This is an answer to prayer and is exactly what the food bank has been searching for!

**Now we are looking to members of the FVEAA for some help.**

**How much will it cost?**

To prepare the van for food bank use it will need around \$2,000 - \$3,000 for new batteries, enclosure, heater and installation.

In the next few months we'd love to publicize the good work of the FVEAA and the generosity of its members who helped make this possible.

**What We Need**

1. **FINANCIAL SUPPORT:** Donate to New Community Counseling and Ministries, a 501(c)(3) nonprofit organization run by Christine Caridi. Donations are tax deductible  
<https://www.networkforgood.org/donation/MakeDonation.aspx?ORGID2=061751180>.
2. **SPACE:** industrial space in south Naperville to hold our refrigerators and freezers.
3. **Refrigerators / Freezers.** We're always on the lookout
4. **Truck Cooling ideas.** Looking for Green ways to keep the inside of the truck cool.

**Thank you FVEAA!!** If you have any questions, please contact Bruce Jones  
[bjone35@aim.com](mailto:bjone35@aim.com) 630-357-6895 or cell 630-881-4988

**Newsletter**

*Nathan Stowe*

Please send submissions to Nathan at [editor@fveaa.org](mailto:editor@fveaa.org).

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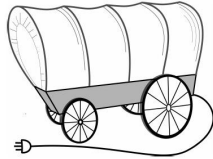
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