

Fox Valley Electric Auto Association

**PO Box 214
Wheaton, IL 60187-0214**

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March 2013 FVEAA Newsletter

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

Note: Meeting Date and Place This Month

Next Meeting

March 15, 2013

Community Christian Church

1635 Emerson Lane, Naperville, Illinois 60540

at the intersection of Ogden and Richert Drive in Naperville

Also called the "Yellow Box." We'll meet in the little theater west side, 1st floor

DOORS OPEN 6:30 p.m. MEETING STARTS 7:00 p.m. ENDS 9:15 p.m.

Directions:

[Community Christian Church](#)

Agenda

- Call to order - Welcome
 - Committee Reports
 - Old business / New Business
 - The Dennis Doney EV Variety Show - a special review of Various EV subjects
 - Electric Bicycle Laws, Federal and State
 - Electrathon Racing
 - Robert Llewallen's Fully Charged Show
 - Turning over an Old Leaf
- Break
- ZAP the Truck
 - ZAP the Mouse

President's Words

Bruce Jones

Hi EVeryone,

The winter months are nearly over and we're just starting to feel the hints of warmer weather. Speaking of weather, I'd like to thank to Liz Optholt from Energy Impact Illinois who, at last month's meeting described an inexpensive program to make your home become more energy efficient, helping you save on heating and cooling costs. And thanks to Sam Carnavacciolo who presented on "A Technical Review of the Tesla Roadster." Both were very informative presentations on various aspects of high efficiency.

Dennis!

This month our own mild mannered but amazingly talented Dennis Doney will present on a variety of subjects from electric bicycle laws to a smorgasbord of racing and other EV information, capping the night off with a description of his ZAP truck and personal experience driving relatively low tech electric vehicles. Dennis is planning to leave the area in the next few months for warmer climates, so we wanted to create a special night for him to share on multiple subjects. I'm calling it the "Dennis Doney Electric Vehicle Variety Show." Should be lots of fun and very interesting.

See you there!

Bruce

Photos from Last Month

Sam Carnavacciolo in the cockpit of his new Tesla Model S (not the Roadster in his presentation)



Sam's Model S.



Robert Dew next to HIS new Tesla Model S.

Energy Impact Illinois
Liz Opholt: Field Organizer
708-203-2559
liz@energyimpactillinois.org



Rich's Ramblings

Rich Carroll

Update on electric car competition for National Science Bowl

The National Science Bowl had their academic portion of their NSB Regional Runoffs on February 8th, 2013 at Argonne National Labs. I was fortunate enough to act as a moderator, scientific judge, and timekeeper for several rounds. Competition between these 4 person teams from various middle schools (6th, 7th and 8th grades) was intense, and I was really, really impressed by the knowledge of the kids involved, and their ability to continue under really strong competitive pressure. Roosevelt Middle School of River Forest, Ill. was the regional winner, with Daniel Wright Middle School of Lincolnshire, Ill in second place.

The next competition is the electric car Regionals, and FVEAA had partnered with Brooks Middle School in Bolingbrook, which will send two teams. The cars are being built, and the Regional Runoffs are on the morning of 4/13/13, at Case New Holland. CNH is just north of the I-55 expressway in Burr Ridge. Anyone who has an interest in this race for student constructed electric cars is strongly encouraged to attend.

As a side note, I have been working on a timer for the competition. While the timer looks extremely similar to the Cub Scout Pinewood Derby (for gravity powered cars) there are some important differences that make most Pinewood Derby timers not useful for NSB. The two biggest factors are the use of a raised track (Pinewood Derby cars straddle a smooth center curb, keeping the cars in their lane) and timing which may go beyond 9.999 seconds. Most of the NSB cars do finish under the 10 second rule, at least in the years that NSB uses electric car kits. But some years NSB uses photovoltaic kits, and some years a hydrogen fuel cell, and in those years, timing goes as high as 20 or 30 seconds. The NSB track is a 20 m (~66 ft) long 60 cm wide ribbon of neoprene for each lane, and it lays on a gymnasium floor. The Pinewood Derby track usually starts from about 32-40 inches of height, and the track is usually 30-40 feet in length. Most of the newer tracks are made of extruded

aluminum, but some of the older tracks are built from wood.

I was aware of several tiny computer designs in the teaching world, and had been waiting for the Raspberry Pi (RP) to arrive. I have run Linux exclusively at home for several years, and the Raspberry Pi runs an embedded Linux. It does have a full operating system (OS) and supports USB devices. The upscale Raspberry Pi sells for \$35.

The Propeller chip is much less expensive (an average system is under \$50) but you don't get to an "OS" it simply takes native code, which you can upload. You do have access to 8 cores, so you can do significant multiprocessing, although the 80 Mhz processor is slower than the RP, which runs an ARM11 processor at 700 Mhz. I am well aware of the Propeller chips, as they are the computer used for the Blue Window display, which mimics analog gauges for EV's, along with digital information.

The third entry was the way I decided to go, as it has better intrinsic timing than the Propeller. Called Arduino, it is really a family of little processor boards. The most common of these is the UNO, which sells for under \$30. It is a nice little design, that while it uses a slow processor (16 Mhz 32 bit Atmel ARM) is able to do timing quite well. All of these choices (RP, Propeller, Arduino) have good support for various I/O (input/output) devices. The Arduino has 14 digital input/output pins (of which 6 can be used as PWM outputs), and an additional 6 analog inputs. Arduino uses 'shields' which plug in to the main board of the Arduino, and are removeable. The shields could contain a display, a connection board, a WiFi board, a network adapter, or any number of relays, and stepper motor controllers, etc. The main board and a shield are about the size of a standard deck of cards. The Arduino is programmed in C++, a common language for computer programmers.

I found one developer who had developed a system for Pinewood Derby timing, and his code had several advantages:

- His C++ code was fully available and modifiable
- It uses easily obtainable libraries
- It supported digital displays for each lane, and could display winning time for a second, and then the ranking of that lane within all the cars in the last race (1st, 2nd, etc.), then repeating the cycle.
- It was designed for a 3.3V photocell using an NPN transistor
- It is configured to have a serial output of data, in a CSV format, which can be used as input to some of the commercially available programs for scoring these races (with several different options for matching the cars, and for scoring the races). The commercial scoring has many additional features, with very pretty display output, and choices of several methods of matching cars for racing, and for analyzing the data.

The local track will be configured as 4 lanes, paired in twos. I have built two 'race bridges' to span the track at the finish line, and have commercial photocells that look down at the dark neoprene and detect any car passing below. All the common commercial photocells tend to require 10-30 volt sources, and the Arduino can be programmed to look at it's input pins for a change from it's normally

closed condition. The Arduino can work on various voltages, but isn't rated beyond 9V DC. So, in addition to the photocells, I have added a voltage divider on each circuit, so the Arduino isn't at risk for higher voltage. The photocell specs do mention that the 12V+ circuit has worked directly with an Arduino in the past, but I see no reason to not use a voltage divider circuit.

As a method of testing the voltage dividing circuit, I looked for a web based program (so it would be Linux compatible) and found circuitlab.com. Create a free account, and use a slick web interface to build a simple or complex circuit. Once you have built it, you can evaluate it and test it online. You are allowed to "simulate" the actions, and to put a probe anywhere on the circuit, where you will get a digital readout of voltage and amperage. It can output to many different formats, including .pdf and .png, and you can share your project with others. Try it, take my circuit diagram (Yes, I do have a backup) and play with it. Drag wires around, watch what happens. Move resistors around, double click on any object to edit the parameters for the object, etc. See:

<https://www.circuitlab.com/circuit/wwxyn2/nsb-photocell-voltage-divider/>

I did spend a significant amount of time, playing with their samples, and rearranging and entering different specifications. The program is quite intelligent, so if you move a wire across a wire, it bridges it with no connection. Drop one end of your wire up to another and it connects them. Wires can be pulled to any useful length. Structures can be grouped and copied.

If you want to see the timer in action, I can bring it to an upcoming meeting, or you can attend the Regional Runoffs (for the 2013 Electric Car Competition) on April 13 at Case New Holland, 6900 Veteran's Blvd., Burr Ridge, IL. See: <http://www.dep.anl.gov/science-bowl/>
The 2013 National Competition will be held in Washington D.C. from April 25 to April 29, 2013.

Meeting Minutes 12/14/2012

Dio Vesselinov

Welcome

Bruce Jones opened the meeting at 7:02 p.m. and had members who drove electric vehicles introduce themselves and say a few words about what they enjoyed the most about their electric vehicle. Dues are still only \$15 per year, the best deal in town.

Old Business

Grant will get with Ted Lowe to discuss getting links between the FVEAA web site and Facebook.

New Business

Note that Dennis Doney has gathered the federal rules for electric bicycles which are limited to 20 mph except in some states where laws override federal law. We'll have an update from Dennis next month.

Committee Reports

Treasurer Todd Dore provided a finance report and the club is in good financial shape.

Chicago Auto Show

Bruce Jones provided an overview of the electric vehicles on display at the Chicago Auto Show. He attended during media day last week and interviewed sales / engineers / designers at all of the displays that had Electric vehicles including the following:

- Cadillac ELR
- Chevrolet Volt, Spark
- Chrysler /Fiat 500e
- Ford Focus, Fusion, Energi
- Honda Ev-Ster Concept car
- Mitsubishi i
- Wheego PEV and DTR Charging stations

Energy Impact Illinois - “How to Lower Your Energy Bills”

Liz Opholt from Energy Impact Illinois presented their program to help homeowners (and townhouse owners) lower energy costs by first paying a Federally subsidized discounted cost for a home inspection. This program is for ComEd, Ameren and Nicor customers.

The audit shows where air leaks exist, or insulation is lacking usually due to openings in the ceiling / attic or basement. Air gap sealing and insulation will dramatically reduce leakage, and save heating and air conditioning costs. The program provides savings, comfort, improved home value

- Windows and doors represent 10 % of leakage, Attics and Basements represent 70 % of leakage
- Step 1 energy assessments cost \$99
- Free assessments are provided to those who host impact parties at their homes

Thanks Liz!

Break

Tesla Roadster Experience

Sam Carnavacciolo then talked about his driving experiences with “Lucy” his Tesla roadster. He described the different charging modes, storage, standard, performance, and range modes, plus ideal versus estimates range.

The meeting ended a 9:15 p.m.

FVEAA Membership Application Form

Name: _____

Address: _____

City, State Zipcode: _____

Phone: _____ Phone Type: Home ___ Work ___ Cell ___

Email: _____

Please check one: New Member _____ Renewal _____

How did you hear about the FVEAA ? _____

| | |
|---|--|
| Member Types and Annual Dues (Please circle one) | Newsletter Delivery Types (Please circle one) |
|---|--|

| | | | |
|------------------|-------|------------------------------|------|
| Individual | \$15 | No Newsletter | \$0 |
| Family | \$20 | Electronic Only | \$0 |
| Business | \$100 | Postal Mailed | \$15 |
| Premier Business | \$250 | Postal Mailed and Electronic | \$15 |
| Charter Business | \$500 | | |

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|------------------------------|
| Total Due from Both Columns: |
|------------------------------|

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

FVEAA

PO Box 214

Wheaton, IL 60187-0214

Attn: Membership

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Exclusive worldwide distributor of WarP™, ImPulse™, and TransWarP™ electric motors for use in electric vehicles and electric vehicle conversions.

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