



EEVC NEWSLETTER

Published by the Eastern Electric Vehicle Club

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Now affiliated with EAA

GREGG WITMER - 2010 EEVC MEMBER OF THE YEAR

Gregg joined the EEVC in March of 2008. Our organization provides information and networking opportunities for individuals interested in learning more about electric and hybrid vehicles and in making EV conversions. Gregg travels over 100 miles from his home in Mechanicsburg Pa. to attend our monthly meetings with a passion to do both.

For the past several years many first time visitors have passed through our door at Plymouth Whitmarsh High School to participate in our monthly EEVC meeting. Most have come to learn, some to contribute to the knowledge pool, and some to display and compete with their vehicles. Gregg has excelled in all three areas.



Gregg Witmer, EEVC Member of the Year, with his converted Saturn

Annually we select an EEVC member to be honored as our EEVC Member of the Year. We select someone who has demonstrated exemplary service to our organization, who has promoted our ideals, and who has been an inspiration to our members.

Gregg has presented several full-

length lecture sessions at our monthly meetings since becoming a member. One was on the electronics of a "Jacobs Ladder." Another explained how to use his home page tool to check battery characteristics for a conversion. Gregg also made a presentation to us on the specifics of his Saturn conversion.

Last year Gregg participated in the 21st CAC competition at Penn State with his Sat-

urn. It was an effort on his part to tow the car out to Penn State without the certified PA inspection. Greg knew that lack of certification could result in “track only” participation. It did. Gregg cheerfully accepted a lesser rung on the competitive ladder and demonstrated a willingness to support the event anyway. He gathered information and posted videos of the event on our Web site and on his home page.

Several EEVC members, in addition to Gregg, were considered for EEVC member of the year. Either candidate under normal circumstances could have been selected. Both have gone beyond the call of duty and have been a source of pride for the EEVC. Gregg was chosen particularly because of his contributions to the education of newcomers to the EEVC and his assistance in video promotion of the 21st CAC. Of the available choices for Member of the Year (past winners are not eligible), none have done more (although several have come close) to aid the newcomer to our organization and to promote the 21st CAC than Gregg. His Web page sources of information to inform the home converter and to promote the 21st CAC have been superb, as have his video contributions to the EEVC Web page. For this reason Gregg Witmer has been chosen as our 2010 EEVC member of the year.

If you have not already done so, visit Gregg’s home page www.zuglet.com. Few EEVC members can boast of a home page of equal quality. Links of interest are as follows:

The Battery List and Pack Calculator — Gregg has used this page to evaluate his battery pack and several used by EEVC members. It will estimate the cost, weight and range of any given pack and will provide charger guidelines. Click the “Design a Battery Pack” link for a more complete explanation and begin to use the tools.

The solar page — A very brief explanation of two small off-grid solar powered systems that Gregg uses in his garage and shed.

The Ford Siemens Motor — A detailed description of the Siemens Ford Ranger EV motor that sold on eBay for \$2000 several years ago. Gregg points out that these motors were sold without controllers and no hope of finding a controller. Gregg has posted the pictures, facts, and commentary on this page.

Gregg’s Saturn conversion is broken down into pages showing demolition, new parts, battery system management, motor, vacuum pump, heater and first public showing.

Lastly, Gregg’s home page has six videos available:

- Overview of the Saturn conversion
- Spinning the Wheels
- What is the 21st Century Automotive Challenge?
- Plus three additional 21st Century Automotive Challenge clips... one for each day of the event.

Gregg’s outgoing friendly, winsome, and humble personality, coupled with all of his talent, make us proud to pronounce him the 2010 EEVC Member of the Year.

Gregg Witmer’s Biography

Traditionally our Newsletter features interesting biographical sketches of our EEVC members, especially our Member of the Year. It is not always easy to find information on new members. (The Newsletter staff of two, appreciates it when our members take the time to provide us their story in writing.) Gregg responded to my request to provide us with his bio. In the process he demonstrated his writing ability. I am sure you will find Gregg’s life story of great interest.

Growing Up

I was born in Lancaster PA. My parents, both retired now, were educators. Dad was a high school science teacher and later became an administrator; Mom was a high school English teacher.

When I was 8, Dad sparked my interest in electricity by giving me one of those big 1 1/2 volt dry-cell batteries and showing me how to power a light bulb and make an electromagnet by wrapping wire around a nail. He then expanded on the electromagnet concept by making a DC motor out of several nails on a spindle. I was hooked. This was what I wanted to do with my life.

My curiosity grew. Everything I could find came apart. Nothing was too big or too small: record players, radios, clocks, televisions, the 1 1/2 volt dry-cell battery, most of my toys, some of my sister’s toys and (regrettably for me at the time) Dad’s Bell and Howell movie

projector. I even dismantled electronic components: resistors, capacitors, motors, transformers and such. I had to know what was inside — I liked handling the different parts and guessing their function and also envisioning how things were manufactured. Dad tried to help me understand some of what I had discovered — sometimes this came after the tired old lecture about not taking apart things that were still needed around the house, like the vacuum cleaner.

I can remember intentionally sticking my fingers in an electrical socket to see what it felt like. I had unplugged a lamp in the living room and partially inserted the plug while touching both prongs... I never really felt the need to conduct an experiment like that again, but I did find a way to share the ‘gift’ of electricity with fellow students in elementary and junior high school by wiring a relay and a 9 volt battery into an electric shocker. It was frequently confiscated by teachers. No one, not me or any of the high school science teachers, could explain how it worked. It was an accident during one of my experiments that I figured out how to make it.

As I got into my teens, my interest turned to lawn mower engines and lawn tractors. I know the neighbors were not overly happy with my speeding around the neighborhood in noisy souped-up garden tractors. That was a short but memorable phase that quickly turned to tinkering with cars.

When I was 16, I started programming computers. My first experience was with a VIC20 on display at K-Mart. Shortly after that, the Commodore 64 came out. I bought one and spent hours going through the included BASIC manual learning the language as I wrote small programs to use what I had learned. At that time my high school offered only one computer programming class and only had about 30 computers in the entire school.

Mom and Dad were always very supportive of my unconventional childhood hobbies — but in spite of my interest in learning everything there was to know about electronics, computers, and mechanics, I did not do very well in school. I’m sure this was a disappointment to both of them, who had spent their lives educating children. When I left to go to college at DeVry Technical Institute in

Columbus, OH, my future as a student was uncertain. However, it turned out that DeVry’s Electronic Engineering Technology program was perfect for me — I immediately felt at home. I quickly learned many concepts and theories that were only slightly obvious to me in my earlier tinkering. Within a few months I understood how my electric shocker worked. Later on, in an effort to merge my mechanical interests with my electronics education, I built a 3-axis pneumatic powered robotic arm for my senior project.

Immediately after I graduated from DeVry, I got a job at Pendu Saw Systems in New Holland PA. Working under a project manager and beside a skilled welder, I undertook my task to design and build a computer controlled robotic arm to nail wooden pallets together. Unfortunately, the project was a failure. The 800 pound arm was too heavy and slow for the manufacturing business. This was a great hardware and software learning experience for me, and I was pleased the thing even worked at all.

After Pendu, I moved on to the engineering department at Cardinal Technologies in Lancaster, PA. Here I designed internal and external modems for personal computers to be manufactured at the company’s on-site electronics assembly line.

Finally, for the past 19 years I’ve been employed at Leister Productions, writing software for the Macintosh and in recent years for the iPhone and iPad.

Video

Shortly after getting married to my wonderful wife in 1999, she and I were asked to video tape my uncle’s wedding. Because we had a great time doing this and were pleased with the compliments we got on the final product, Cathy and I decided to start a part-time videography business specializing in weddings. We did quite a few weddings and various band demos over a period of five years, at which time we decided to give it a rest due to lack of energy and time. I still enjoy doing smaller video projects and have done tutorial and marketing videos for my current employer.

My Saturn EV Conversion

I wanted to build an electric car of some



Pulling the engine from the Saturn

sort for many years — mainly because of my interests listed above but also because of the simplicity of replacing hundreds of moving parts with a single moving part. Also, being a computer programmer, I missed the “hands-on” aspect of working with tangible items.

My first real attempt started when Cathy bought me a 1997 Saturn with a blown engine for Christmas in 2005. I think it was her way of saying “Shut-up about the electric car and build it already!” However, this turned out to be a false start. I couldn’t find a controller for the motor I had bought and couldn’t get my head around how to couple the motor to the transaxle. I put it all on a back burner for a few years while keeping an eye on the improving availability of home EV conversion supplies.

The project really started in March of 2008, around the same time I joined the EEVC. I purchased an AC motor with a Saturn adapter plate from an EV parts supplier in California. Most of my time was spent designing and building motor mounts and battery boxes for the 14 sealed lead acid batteries. The project took over two years and the final product was beautiful. However, it was a very heavy car that only had a range of about 20-25 miles. Acceleration was poor above 40 miles per hour and the extra weight was noticeable when driving.

I towed the Saturn up to the 2010 21st Century Automotive Challenge at Penn State this year. I had a great time “competing” in the event — although, I was disappointed that there were no awards for last place. I met some very bright people and got to know many of the EEVC members a little bit better.

I’m currently designing a lithium-based battery pack to fit in my Saturn’s existing battery boxes with the expectation of improved performance and range and reducing the weight. I’ve made all of my battery research available on my Web page in the form of an interactive list of batteries and a battery pack calculator that predicts the cost, weight, range and life of the pack.

The EV conversion project has been invigorating as I’ve learned to use new tools like cut-off saws, high speed grinders, spot welders, and the mother of all wire crimpers. I’ve gotten a lot of satisfaction fabricating unique parts into a completed and drivable project car.

EEVC (Eastern Electric Vehicle Club)

The EV conversion process can be a cold and lonely road — the members of the EEVC have been a great help in answering questions and offering tips and suggestions for people converting their vehicles. I try to return the favor in my small way by sharing some things I have learned and think would be of interest to the group.

I’ve always believed one of the best ways to grow is to surround yourself with people who are a lot smarter than you. I have the opportunity to do this once a month at the EEVC meetings. The membership of the EEVC is not just a well informed and educated group but also a very hands-on and experienced group of people. I always go to the meetings feeling pretty smart and then leave knowing I still have much more to learn.

FIRST LEAF SOLD IN CA By California Pete



The first commercially-purchased Nissan Leaf has been delivered to a buyer in California. On Saturday, December 11 Olivier Chalouhi of Redwood City took delivery of the first one sold. Chalouhi, said the *San Francisco Chronicle*, stepped up to the Leaf from his previous main ride, an electric bike.

The first Chevy Volt purchased in the Bay Area wasn’t the first one sold — that honor

went to Jeffrey Kaffee, of Parsippany, NJ, who picked up his car on December 15 — but five days later Patrick Wang of Berkeley, took delivery of the first Volt in the area.

Tesla looks to batteries to raise profits

On December 31 Bloomberg News reported that Palo Alto-based Tesla Motors says that its choice of laptop-style lithium batteries will enable it to make a profit on its Model S sedan at an annual sales volume of 20,000 units, considerably fewer than the 500,000-unit break-even point for the Nissan Leaf quoted by Nissan CEO Carlos Ghosn. The Leaf's battery, based on larger cells, costs considerably more than that used in the Model S. The article cites Tesla co-founder and former CEO Martin Eberhard that "Tesla's battery packs may cost as little as \$200 per kilowatt hour, compared with about \$700 to \$800 per kilowatt hour for large-form cell lithium-ion packs."

Still hot on wave power

San Francisco's ex-mayor Gavin Newsom (recently elected Lieutenant Governor) is still pushing ocean power, according to the *Chronicle*. "Armed with a study showing waves about eight miles off the coast of San Francisco could produce enough energy to power at least 22,700 homes at a cost comparable to solar power, and bolstered by U.S. Interior Secretary Ken Salazar's recent announcement that federal regulators would streamline the permitting process for Atlantic Coast wind farms, Newsom is pushing to have a pilot wave-power program running by 2012 or early 2013," said the paper

Trying to dig our way out

While the East Coast works to get rid of the snow and ice on the roads, the Golden State's new governor Jerry Brown is trying to dig the state out of the \$25 billion hole it finds itself in after years of financial mismanagement. He has proposed severe — some might say savage — cuts to all manner of programs, including various state agencies, aid to the poor, for prisons, for higher education, and the list goes on, plus a continuation of temporary tax increase due to expire. All this still has to get pass the famously-fractious legislature, and in some cases the voters, but it has been noted

that government employee unions, which had screamed when similar cuts were proposed by ex-governor Schwarzenegger, have remained relatively quiet this time.

Don't forget the silly stuff

Following a lot of hard political infighting, the farthest-left members of the San Francisco Board of Supervisors have been reduced to a minority, but we shouldn't worry that this will reduce their monthly output of silliness; SF remains, as the saying goes, "49 square miles surrounded by reality."

Our first entry, however, comes from the People's Republic of Berkeley, where the city council first considered, then decided to table, a resolution that would have declared Pfc. Bradley Manning, accused of leaking thousands of secret government documents to Wikileaks, as a hero. The source of the resolution was the city's Peace and Justice Commission, but it was decided to put the matter aside until it was determined if Manning actually did that for which he was to be honored (and for which he is currently incarcerated).

Dreams of dollars up in smoke

Just south of Berkeley the city of Oakland, burdened as are most cities in the state with budgetary woes, in July put forth a proposal to allow industrial-scale growing of marijuana, with the idea that the city would reap millions in taxes from farm operators. Alas, the Oakland city attorney and the Alameda county prosecutor pointed out that, with Proposition 19 having been voted down, such an arrangement would be a violation of state law (not to mention federal law), and might even subject council members to prosecution for aiding and abetting or conspiracy.

The measure was dropped.

MINUTES OF DEC, 2010 MEETING Don Zimmerman

Meeting December 8, 2010. Presided over by President Oliver Perry. Note that the Newsletter is numbered Vol 30 No 12... The club has stayed and thrived for 30 years. A party was planned but too many people were too busy.

EVA newsletter

Norman Flojo introduced articles: Tesla is

buying the CA plant previously used by the GM and Toyota joint venture to expand products. Nissan Leaf is to begin production in Tennessee. More production of all vehicles will be in the U.S. because high oil prices mean high freight charges to ship large heavy items like cars from the Far East. The U.S. government has been handing out monies for car and battery projects

Fisker Motors

Denny Stichter reviewed an article he recently found relating to the electric Fisker. Mike Manning commented about the idled GM Boxwood plant outside Wilmington DE. The UAW wants to represent workers hired to build a model hybrid now sold in Europe (Denmark/Netherlands) but plans are now on hold. Mike also told us he had seen a prototype Fisker which had two large electric motors which eliminated differential.

ChargePoint

Ken Barber discussed his experience getting a swipe card that would allow him to charge his car in the first public charging station in Pennsylvania, located in South Philadelphia. These places are also around the country to charge the batteries @ 240 V 80 A but actual output is 180 V 30 A. A special plastic charge card is needed. Speakers implied that the U.S. put up the monies and company stockholders are mostly government workers.

Electrical Display of Magnetics

Ollie Perry demonstrated magnetic inductance and characteristics of magnetic fields. What is or is not magnetic also introduced the next speaker. He also illustrated the essentials of a motor verses a generator, the special features of AC and DC currents. The demonstration featured charging a magnetic field with coils.

Momentum Dynamics, Malvern, PA

CEO and Founder Andrew Daga presented near-field coupling for electric battery charging. He forecast that petroleum is becoming scarce and will force the rise of electric cars. Now the U.S. sells 10 to 15 million vehicles per year but in the near future China and India each will sell four times that amount. Some type of electric propulsion is necessary. He

proposes wireless charging where the two coil fields are a maximum 8 to 10 inches apart. His illustration is the Sears induction stove top using one or several burners. One layout would be located on the ground and one attached to the underside of the vehicle. These flat coils are at 15.7 megahertz. They want 90% coupling and are now at 60% Beta design.

There are two promising test projects: 1. Two paratransit buses for BARTA, the Reading, PA area transit agency, and 2. a Los Angeles airport car rental agency passenger transfer bus.

NEWS UPDATE

Ford shows two EVs

Ford Motor Co. is showing a number of high-mileage vehicles at the North American International Auto Show in Detroit; the two of greatest interest to EVerS are the Focus Electric and the C-MAX Energi, the company's first plug-in hybrid.

Ford Focus Electric



Ford Executive Chairman Bill Ford stands beside the Ford Focus Electric during the vehicle's reveal in New York City, Friday, Jan. 7, 2011. (Photo/Stuart Ramson/Ford).

A few technical specs:

Motor: Permanent magnet AC, 122 hp (92 kW)

Top speed: 84 mph

Battery

Type: Li-ion

Capacity: 23 kWh (liquid cooled/heat-ed)

Charge time:

240 V: 3-4 h

120 V: 18-20 h

The range estimate is given only as in the 100 mile area. The high-tech dashboard is

touted as making it easy for the driver to keep track of how many miles are left in the battery; let's hope that gearheads don't become fascinated by it and drive into things.

C-MAX Energi PHEV



The C-MAX Energi PHEV, which Ford touts is due out in North America in 2012 and Europe a year later. Specs are notably vague.

Volt 2011 North American Car of the Year

The Chevy Volt, which earlier won the Motor Trend Car of the Year award, has also been named the 2011 North American Car of the Year at the North American International Auto Show. In light of strong interest, General Motors has announced that Volt production is being raised to 45,000 Volts in 2012 from 30,000.

New batteries coming for Volt



General Motors has licensed technology from Argonne National Laboratory that promises to improve battery performance in the Volt electric car by 50 to 100 percent. GM and LG Chem, maker of the Volt's battery, have agreed to license Argonne's patented cathode material technology, which uses a mix of lithium and manganese-rich metal oxides that it says increases durability and safety and will allow the cathode to hold as much as double the energy as

conventional cathodes. This will be combined with LG Chem's safety-enhanced SRS (separator) technology.

The Volt's battery is estimated to cost \$8,000 and the larger Leaf battery is estimated to cost \$12,000.

Carbon capture may cause earthquakes

On December 14 the *San Francisco Chronicle* reported on a warning by Stanford geophysicist and seismic expert Mark Zoback that efforts to get rid of carbon dioxide by pumping it deep into the earth could lead to widespread earthquakes.

"Although those quakes would not be particularly destructive," the *Chronicle* said, "they would be widely felt and disruptive — and it would also cost billions of dollars to create thousands of disposal sites for the greenhouse gas."

Zoback's conclusions, delivered in a talk on the opening day of the American Geophysical Union's annual meeting in San Francisco "could have repercussions for research projects backed by the U.S. Department of Energy. So-called 'carbon sequestration' or 'carbon capture and storage' projects have focused on what could be done in regions of the country where coal-fired power plants emit billions of tons of carbon dioxide every year."

There is also the potential problem that many of the formations around the country into which the gas might be pumped are not as impermeable as hoped, which would allow the CO₂ to escape over time.

It's melting, it's melting

Along the same lines, a recent *Nova* program, "Secrets Beneath the Ice," covered efforts to figure out what is likely to happen to the global climate by determining what has happened in Antarctica in the past. Scientists drilled deep into layers of sediment both on land and off the shore of the southern continent, and their data suggested that as climate has changed over the last few million years the Antarctic ice sheet has gone from many feet thick to nonexistent and back many times, sometimes making the transition quite quickly. With carbon dioxide at extremely high levels and rising there is a strong likelihood that much or all of the southern polar cap could melt, although how long that might take is

unknown. Suffice it to say, if it all melts the worldwide sea level is likely to rise by as much as 120 feet. Even a fraction of that would be catastrophic, with the heavily-populated coasts inundated and hundreds of millions of people displaced.

AN INSIDE LOOK AT THE VOLT

Quayside Publishing has sent us a review copy of *Chevrolet Volt: Charging into the Future* (ISBN-13-9780760338933), by Larry Edsall, and with a foreword by GM's Bob Lutz. The boom does a pretty good job of telling the story of how the Volt was developed, from original concept to deliverable product. It's filled with lots of detail, plus a great many photos taken at every stage of the project.

EEVC members may be able to get special deal on this book. Check with President Oliver Perry for details.

COMING EVENTS

Advanced Automotive Battery Conference
January 24 - 28, Pasadena, CA. For info go to <http://www.advancedautobat.com/conferences/automotive-battery-conference-2011/index.html>

SAE 2011 Hybrid Vehicle Technologies Symposium + Electric Vehicle Technologies Day

Feb 9-11, Anaheim, CA. Go to www.sae.org/events/training/symposia/hybrid

EV Charging Infrastructure USA 2011
Feb 28 - Mar 1, San Francisco. www.electric-vehicle-charging-infrastructure.com/

Green Truck Summit
March 7-10, Indianapolis, IN. Contact Susan Romeo, sromeo@calstart.org, 626-744-5600

Photovoltaics World Conference & Expo
Mar 8-1-, Tampa, FL. Go to www.pvworldevent.com.

2011 AltCar Expo
Mar 10, Austin, TX. For info go to [www://eventful.com/austin/events/2011-alt-car-expo-/E0-001-034098391-2](http://www.eventful.com/austin/events/2011-alt-car-expo-/E0-001-034098391-2).

SAE 2011 Powertrain Electric Motors Symposium — for Electric & Hybrid Vehicles
March 23, Indianapolis. Go to www.sae.org/events/training/symposia/emotor/
Plug-in Electric Vehicle Infrastructure

Conference & Exhibition USA 2011

Mar 31-Apr 1, San Diego. Go to www.evupdate.com/electricvehicleusa/index.shtml

SAE 2011 World Congress

Apr 12-14, Detroit. Go to www.sae.org/congress/

EDTA 2011 Conference & Annual Meeting

April 19-21, Washington, DC. Go to www.edtaconference.org.

EVs in Macungie

April 30, Macungie (PA) Memorial Park. Contact jisaacs@buckscountyrenewables.com.

Solar 2011

May 16-21, Raleigh, NC. For info go to www.ases.org/index.php?option=com_content&view=article&id=18&Itemid=147

1st International Electric Vehicle Technology Conference 2011

May 17-19, Yokohama. For info go to www.evtec.jp.

11th Challenge Bibendum

May 18-22, 2011, Berlin, Germany. Go to www.challengebibendum/en

DoE Solar Decathlon 2011

Sept 23-Oct 2, Washington, DC. Go to www.solardecathlon.gov/

MEETING SCHEDULE

Meetings are held in Room 49, Plymouth-Whitmarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

Feb 9

Mar 9

Apr 13

May 11

ADVERTISEMENTS

*** FOR SALE ***

Numerous electric vehicle parts, various lengths of cable, battery chargers, gauges, aircraft starter/generators and two electric Pedalpower bikes.

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