EEVC NEWSLETTER

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HIGHLIGHTS OF THE 21ST CENTURY AUTOMOTIVE CHALLENGE

Oliver Perry

The weekend of May 21st seven vehicles belonging to EEVC members headed out to Penn State to compete in the annual 21st Century Automotive Challenge. Several weeks previous Dr. Joel Anstrom, head of the Hydrogen Hybrid Research Transportation Lab and the director of the event, met with Mike Manning, Ken Barbour and me to review the scoring and to go over charging procedures. When we arrived on the campus for our planning session we met Joel, who had just returned from New England (with one of his assistants) towing back the smaller of the two NESEA charging panel trailers used in the former Tour de Sol. As Joel pointed out he had been given a lot of valuable electrical supplies needed to charge electric cars, but the panel had to be retrofitted to our specific needs. Now, several weeks later, Mike Manning and I arrived Thursday evening May 20th tow-

21st CAC 2010 Overall Best Electric Vehicle Trophy winner Brandon Hollinger joins the wall of fame in room 49 at Plymouth Whitemarsh High School.

(text continues on p 3)

(below) Students loading boxes into Dr. Paul Kydd's hybrid pickup truck for the cargo carrying capacity of the competition.

(below) Tom Houck, Dan Monroe, Oliver Perry, and Mike Manning represented the EEVC team, borrowing Ken Barbour's converted yellow Geo Metro for the competition.

Brandon Holliger drives his Saab around the track.

Dr. Joel Anstrom discusses Brandon's overall performance in the 21st CAC at the Awards Ceremony.

Pictured at the top of the parking garage on the Penn State Campus, which was a stop on the "about town shopping competitive tour" is Methacton High School's electric Lomax, originally converted by EEVC member John Murphy.

Ed and Jim Kriebick competed again in the Bio Diesel category. Seated on the bumper of their gas free vehicle both wait their turn in the box packing cargo competition line. This year's preliminary scoring results indicate that they were beaten out by a VW Jetta.

Alan Arrison, seated in his VW Rabbit Pickup, was last year's winner of the range event and therefore was designated as the official pace car for this year's range event. Alan won again this year with an outstanding 100 mile range performance. The speed on the track was reduced to about 30 mph due to wet conditions.

Don Aucker weighs in with his top performing Tesla. The Tesla shattered expectations with top range performance completing an amazing three Tour de Thor laps in regulation time and in addition completed 20 short laps around the test track when he ran out of time to complete all of the short loops available. His total miles driven on a single charge was about 235 miles. The Tour de Thor is a very rugged and steep mountainous route.

The Tesla and the Mini-E were placed in separate production vehicle categories. Ken Barbour, whose car is in the background left, placed second to Don Aucker's Tesla. In range the Mini-E went twice around the mountainous 70 mile Tour de Thor loop, finishing with four loops on the one-mile test track, giving Ken a total of 147.3 miles of range. Pictured 21st CAC director Dr. Joel Anstrom commends Ken's performance at the awards ceremony.

EEVC member Greg Witner, seated in his newly converted Saturn, gets ready to compete in the range event. He was very pleased with the experience in his first competitive event. More details in the upcoming Special edition.

ing Ken Barbour's Geo Metro conversion, a few hours after Ken Barbour. Ken had stopped mid way in Lebanon PA at the home of Don Auker to charge his Mini Electric Cooper, which he drove all the way from New Jersey to Penn State. The three of us met again with Joel and began to ready the trailer for charging. At this point Joel had the services of several Penn State students and volunteers to assist him.

The competition got under way the following Friday morning as competitors began to arrive. The EEVC dominated the field with seven vehicles. In addition to the Tesla, Mini Cooper, Geo Metro, Saab, Saturn, VW Rabbit pickup, F-150 hybrid, and Kriebick Biodiesel, there were approximately five other vehicles entered. Bucks County Renewable, member of the EEVC was also represented at our event but was unable to bring their shining new VW Van conversion with them.

The weather for the weekend was mixed with sun and rain but the rain stayed away at the critical times. Friday we suffered through the usual technical inspections on route to the exciting autocross. The autocross event as usual was exciting with the Mini-Cooper, Tesla, VW Jetta, and Alan Arrison's VW pickup all pressing for the best time. Saturday was "around town day" with cargo testing and efficiency. Sunday was range day.

Due to several constraints we do not have the special edition covering the details and official results of the 21st CAC event printed at this time. Look forward to receiving it sometime relatively soon.

EEVC MEMBER WINS AT POWER OF DC EVENT

Ken Barbour proudly displays his two first place trophies that he won at the Power of DC this past weekend in Hagerstown Maryland, while his car charges at his home in Deptford, New Jersey.

Driving his Mini Cooper Electric, Ken came in first place in the autocross held Saturday June 5th and first place in the drag competition held Sunday June 6th. (The Tesla cars were placed in their own separate division. All other electric cars, both production and conversions, competed in the other division.) Thirteen cars competed in all. EEVC member Alan Arrison came in second in the autocross driving his converted VW pickup. Alan and Ken have been neck and neck in autocross for the past several years.

Ken actually drove his Mini Electric Cooper 100 miles to Lebanon Pennsylvania where he recharged it at the home of Don Aucker. After a three hour charge Ken drove the remaining 100 miles down to Hagerstown via route 81 to attend the weekend Power of DC event. He left Hagerstown last Sunday evening at approximately 9:00 PM and reversed his trip, arriving back home at 4:00 AM Monday. Ken has proven that the Mini E is an outstanding reliable electric vehicle, driving it hard and fast for the past 12 months. His lease is up in a few days and he, like all the other 450 individuals who leased these cars, will have to surrender the vehicle to BMW officials who, it has been rumored, may crush them, having completed their consumer field test.

NEW JERSEY VENTURER HEADS FOR THE MUSEUM

Dan Carlin recently picked up the hydrogen fuel cell converted Solectria Geo Metro from the auction car lot in Ewing, New Jersey for the second and last time. The vehicle was converted by a consortium of educators, businesses and the New Jersey Department of Transportation (NJDOT) under the Christy Whitman administration In 1999. After lending the vehicle to the Boyertown Museum for the past decade the state of New Jersey recently recalled it and placed the vehicle on the auction block. Boyertown Museum was able to place the highest bid and purchase the vehicle back for the museum.

ELECTRIC VS BIODIESEL
Ed Kreibick

My interest in electric cars started in 1979 after a family vacation resulted in a unplanned visit to Sebring, Florida and the factory producing the Comuta-Car. My family has a long history in the automobile field. This interest grew into a dealership selling a variety of electric cars, conversion supplies and plans. Both my wife and I drove electric cars daily from 1980 to 2001. Our vehicles ranged from CitiCars, ComutaCars, Lectric Leopard Renault LeCar conversion, Solargen AMC Concorde conversion, Southcoast Technology VW Rabbit conversion and Eagle Picher Ford Escort conversion along with various local home built conversions. We totally enjoyed driving electric cars, charging at home on off peak electric rates and convenience charging wherever available. The cars all functioned fine within their designed limitations with minimal maintenance or problems. The biggest drawback with all the cars was the life of the traction batteries. After the first year the batteries would start to fail regardless of use or charge cycles usually one or two at a time. I tried all types of lead acid batteries, but always the same failures after a year. I hope advancements in batteries will eliminate these failures, unfortunately lead acid batteries were the only affordable replacements.

In December 2001 my father passed away and I inherited his 1976 Mercedes 300D. My father's experience with diesel engines started during World War II in the US Navy. He always told me how dependable and simple the diesel engine was. In 2008 my youngest son, James decided to do his high school senior project on Biodiesel using my father's old Mercedes as the test vehicle. Our Biodiesel is produced using waste vegetable oil donated from local restaurants. We used the book "From the Fryer to the Fuel Tank" by Joshua Tickell as a guide to make our fuel. Currently we process about 25 gallons of fuel per week with over 800 gallons processed to date.

We totally enjoyed driving electric and hope that today's batteries are more dependable with longer life. The fact that the Mercedes did not need modification to run on biodiesel made vehicle state inspection and insurance coverage much easier. We produce our fuel in a separate building from our house to eliminate any questionable danger from stored chemicals or fuels. I hope to try our fuel on other diesel powered vehicles, including lawn mowers and use as a home heating fuel.

2010 JR. SOLAR SPRINT A SUCCESS

The track set up outside the Franklin Institute before the activity began (all pictures: Jay Beckman)

Most of us were at Penn State at the time of the Jr. Solar Sprint. We thank club officer Jay

Beckman for representing the EEVC at this year's Jr. Solar Sprint. Jay helped to select the recipient of the EEVC Best Overall Jr. Solar Sprint Vehicle Award. The award was presented to Pira Ganesh & Kimberly Hane from Schwenksville Elementary School.

Official event winners were as follows:

1st Speed - Bloody Baron, Jeffrey Hu & Ray Zimmerman - Montgomery School

2nd Speed - Solar Puff Girlz, Maria Coleman & Danielle Gautnier - G.A. Stetson Middle School

3rd Speed - Pa-Boom, Julie Uchitel & Ava Longacre - Wyndcroft School

1st Technical Merit - Movie Maker, Pria Ganesh & Kimberly Hane - Schwenksville Elementary

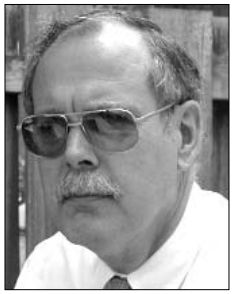
2nd Technical Merit - RV, Miguel Guerra-Solano & Tom Abraham - St. Catherine of Siena

3rd Technical Merit - Angled Carbon Killer, Aaron Yeiser & Stefan Schweikert - Schwenksville Elementary

Most Creative Vehicle - Shell Racer, Rebecca Hane & Anna Hansen - Perkiomen Valley M.S. West

Best Over All Vehicle - Movie Maker, Pria Ganesh & Kimberly Hane - Schwenksville Elementary

NEW LIFE FOR NUMMI
By California Pete



Not long ago the NUMMI plant in Fremont closed up. It was the last automobile plant in California, and marked the sad end of a 25-year joint venture between GM and Toyota. Almost 5000 employees were laid off from the plant itself, as well as thousands more from supplier companies.

Then on May 20 Toyota announced that it was investing $50 million in Palo Alto-based EV maker Tesla Motors. And later the same day came the announcement that Tesla would use $42 million of that to buy the Nummi plant and reopen it to build the Model S sedan. There are also reports that the two companies plan to bring out a car with a Toyota body and a Tesla drivetrain. Talk abut leapfrogging your competition.

Tesla head Elon Musk announced that the company was hiring about 50 people a month, and expected to have about 1000 in the plant within the next few years — a good number of them ex-Nummi workers.

Tesla will be using perhaps a fifth of the plant for some time, but just to see the place reopen is a very hopeful sign.

The sea lions are back

The famous sea lions of San Francisco Pier 39 have returned, just in time to celebrate the 20th anniversary of their arrival. Last year a great many decamped for parts unknown, but now there are about 400 barking happily, keeping the tourists' cameras snapping — and adding their distinctive aroma to the air.

PHEV kits at the Maker Faire

The Maker Faire event, held May 22 and 23 in San Mateo, had the usual collection of flame-spouting sculptures, steam punk inventions and odd robots, but this year had something of special interest to EVers: a display of do-it-yourself PHEV conversion kits for the Prius by a Berkeley-based company called 3prongpower (www.3prongpower.com, 510-868-4133). Two models were available, both using lithium iron phosphate batteries. The smaller of the two is a 4 kWh unit that claims to give up to 15 miles per charge of electric motor assist and the ability to go up to 34 mph on battery alone, all for $4700 installed, or $4000 as a kit that the company says takes eight hours to install.

The other version (above) packs 10 kWh and claims up to 40 miles of pure EV driving (or up to 75 miles of mixed use driving at up

to 100 mpg city/75 mpg highway) and 52 mph on battery alone. This one goes for $12,700 and is not available as a kit, since it requires a rear suspension upgrade.

ELECTRIC VEHICLES, INFRASTRUCTURE AND YOU EVENT

From the Greater Philadelphia Clean Cities Program:

"The Greater Philadelphia Clean Cities Program is sponsoring a stakeholder meeting to give government, fleet managers, municipalities, colleges, universities, parks departments and interested parties, information about electric eehicles. The movement has begun to bring electrification of vehicles to our cities. Learn from our panel of experts how this may happen. From utility supply to end-user consumption habits and Electric Vehicle Manufacturers, learn first hand how this will affect you.

"Please join us to listen to and view presentations and panel discussions from representatives from all components that will be involved in transitioning to electric vehicles. After the presentations manufacturers will be on hand to demonstrate the vehicles outside for a ride and drive. Test them out, kick the tires and see what the buzz of electric vehicles is all about." The event will conclude with a networking BBQ. For information go to www.phillycleancities.org, or call Tony Bandiero at 215-990-8200.

NEWS UPDATE

Chevrolet, OnStar prepare first responders for electric vehicle technology

From GM — Chevrolet has joined with OnStar and national first-responder organizations to announce the first automotive manufacturer-sponsored training program to educate first responders nationwide on EV technology. The June 2 announcement was made with leaders of Chevrolet, OnStar, the International Association of Fire Fighters (IAFF), International Association of Fire Chiefs (IAFC) and the National Emergency Number Association (NENA).

The training sessions will feature the Chevrolet Volt and will begin at the IAFC's Fire-Rescue International Conference, Aug. 23-27 in Chicago.

During the past several months, Chevrolet has collaborated with first-responder representatives from national safety organizations to develop educational materials for firefighters, law enforcement, emergency medical technicians and emergency dispatchers nationwide. This will help ensure the training meets the needs and answers the questions their colleagues are likely to have about EVs.

Their feedback is being incorporated into training materials that will be available on the tour and posted on a targeted Web site for departments unable to attend the training sessions.

The training will include animation and illustrations of the Chevrolet Volt, highlighting locations of high-strength steel, cut points for extrication, first-responder labeling, automatic and manual electrical shut-off and more.

GM to develop EV for India

On May 27 *Bloomberg News* reported that General Motors has scrapped a joint EV venture with Reva Electric Car following the sale of a 55 percent stake in that company to Indian SUV maker Mahindra & Mahindra. GM will instead develop a new EV for India using its own technology, and will consider offering the Volt in India after its official debut in November. The schedule for a purpose-built EV for India was not announced.

Reva, at the same time, says Bloomberg, is moving ahead with plans "to begin selling the lithium-ion- powered Reva NXR as early as October" at a selling price of "about 14,995 euros ($18,500) in Europe, the automaker said last year. The three-door, four-seat hatchback has a top speed of 104 kilometers (65 miles) per hour and a range of 160 kilometers (100 miles) per charge."

Nissan dedicates Leaf battery plant in TN

On May 26 Nissan broke ground on a manufacturing facility in Smyrna, TN, that will produce the lithium-ion batteries that power the Nissan LEAF; the car itself will be produced at Nissan's vehicle assembly facility in Smyrna beginning in 2012.The compamy expects the two plants together to create up to 1300 jobs when operating at full capacity. The battery plant is planned to have

1.3 million square feet of production space and be capable of producing 200,000 batteries annually. It will be located adjacent to the vehicle assembly plant, which will be retooled to accommodate production of Nissan LEAF and will be capable of producing 150,000 electric cars annually.

The investment in the two plants, which could reach $1.7 billion, initially is being supported by a U.S. Department of Energy loan for 80 percent of that investment, up to $1.4 billion.

Leaf order book closed

On May 25 *The New York Times* reported on an announcement by Nissan chief executive Carlos Ghosn that the company had received ,000 orders in the United States and Japan for the Leaf, which sells out the car for this year.

Renault-Nissan Alliance signs ZEV partnership in Québec

One June 1 the Renault-Nissan Alliance announced that Nissan Canada has entered into a memorandum of understanding (MOU) with the Government of Québec, the City of Montréal, Québec City, Hydro-Québec and the Agence de l'efficacité énergétique du Québec to advance zero-emission mobility in Québec. The parties will work together to plan the necessary charging infrastructure and to promote the use of zero-emission vehicles in Québec.

China to subsidize electric, hybrid car purchases in five cities

On June 1 China released details of its green-car subsidy program designed to boost the nation's auto industry and cut vehicle emissions, according to the Xinhua news agency. Subsidies of up to 60,000 yuan ($8784 U.S. dollars) will be given to buyers of pure electric vehicles in the five cities chosen for the pilot program, the Ministry of Finance said in a statement on its website. Buyers of plug-in hybrid cars will receive up to 50,000 yuan ($7320) in subsidies. The cities chosen for the pilot program are Shanghai, Changchun, Shenzhen, Hangzhou and Hefei.

More U.S., Chinese companies cooperating

On May 28 *GreenTech Media* reported that EnerDel has entered into a joint venture with Chinese auto parts supplier Wanxiang for the joint production of lithium ion batteries "with an eye on selling to the explosive Chinese car market, now the world's largest."

This agreement comes on the heels of similar agreements between other U.S. and European and Chinese companies, the westerners contributing technology and the Chinese manufacturing capacity and market access.

Cambridge scientists home in on lithium battery safety flaws

Scientists at Cambridge have developed a simple, accurate way of "seeing" chemistry in action inside a lithium-ion battery, according to a University press release. By helping them understand how these batteries behave under different conditions the new method — which involves Nuclear Magnetic Resonance (NMR) spectroscopy — could help researchers solve the fire safety problems that have dogged the development of these batteries.

Lithium batteries have one serious disadvantage: over several charge and discharge cycles, particularly if the batteries are charged quickly, minute fibers of lithium, known as dendrites, can form on the carbon anodes. These lithium fibers can cause short circuits, causing the battery to rapidly overheat and catch fire.

Writing in the journal *Nature Materials*, Professor Clare Grey of the Department of Chemistry says: "These dead lithium fibers have been a significant impediment to the commercialization of new generations of higher capacity batteries that use lithium metal as the anode instead of the carbons used today."

Scientists have use theoretical models and optical and scanning electron microscopes to study dendrite formation, but finding a way of quantifying the amount of dendrites formed has proved elusive until now.

The paper describes using a new method based on NMR spectroscopy to see chemistry in action within a tiny, 1 cm long, battery enclosed in the same kind of aluminum bags used to keep coffee fresh.

According to Professor Grey: "Fire safety is a major problem that must be solved before we can get to the next generation of lithium-ion batteries and before we can safely use these batteries in a wider range of transportation applications. Now that we can monitor

dendrite formation inside intact batteries, we can identify when they are formed and under what conditions.

"Our new method should allow researchers to identify which conditions lead to dendrite formation and to rapidly screen potential fixes to prevent the problem."

Ford investing $135 million in two Detroit plants

A May 24 AP story reports that Ford has announced that it create a "center of excellence" for EV development at factories in Ypsilanti Township and Sterling Heights, MI "to design, engineer and produce components for its next generation of hybrids and fully electric vehicles." The Ypsilanti plant will get $10 million to build battery packs, while the Sterling Heights transmission factory will get $125 million "to build the continuously variable hybrid transmissions now built in Japan."

Building out the EV infrastructure

One June 2 Coulomb Technologies (Campbell, CA) announced that it will deliver free home and public ChargePoint EV charging stations throughout the U.S. The ChargePoint America program will provide nearly 5000 charging stations to program participants in Austin, Texas, Detroit, Los Angeles, New York, Orlando, Sacramento, the Bay Area, Redmond, WA, and Washington DC and is a strategic partnership with Ford, Chevrolet and smart USA. For more information go to the ChargePoint America Web site at www.chargepointamerica.com.

COMING EVENTS

Formula Sun Grand Prix
June 12-18, Cresson, TX. Go to http://americansolarchallenge.org/events/asc2010

Second German Electric Vehicle Congress
June 17-18, Bonn, Germany. Information at www.e-mobil-kongress.de/e-mobil2010/data/uploads/File/10-05-10Flyer-E-Mobilen.pdf

American Solar Challenge
June 19-27, Tulsa, OK to Chicago. Go to http://americansolarchallenge.org/events/asc2010/american-solar-challenge/

57th Annual Electric Utility Fleet Managers Conference
June 20-23, Williamsburg, VA. Contact Wes Keller, PPL, wckeller@pplweb.com, 610-774-5852

Electric Vehicles, Infrastructure and You...
June 23, Philadelphia. Go to www.phillycleancities.org, or call Tony Bandiero at 215-990-8200.

Plug-In 2010 Conference & Exposition
July 26-29, San Jose, CA. Go to http://plugin2010.com

Fundamentals of Hybrid Electric Vehicles
Aug 2-4, Troy, MI. For information go to www.sae.org/pdevent/C0511

Introduction to Hybrid and Electric Vehicle Battery Systems
Aug 5-6, Troy, MI. Go to www.sae.org/pdevent/C0626

Hanover, 63rd International Motor Show 2010
Sept.23-30, Hanover, Germany. Go to www.iaa.de/index.php?id=besucher&L=1

SAE Convergence 2010
Oct 19-20, Detroit, MI. Go to www.sae.org/convergence

Southern ElectricVehicle Expo
Oct 29-31, Asheville, NC. Go to http://sevexpo.com/e107_plugins/calendar_menu/event.php?1288378800.event.1

EVS25
Nov 5-9, Shenzhen, China. Go to www.evs25.org/event/2009ddc-en/index.html

Green Truck Summit
March 7-10, 2011, Indianapolis, IN. Contact Susan Romeo, sromeo@calstart.org, 626-744-5600

MEETING SCHEDULE

Meetings are held in Room 49, Plymouth-Whitemarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m. Note that here are no July or August meetings.

Sept 8

Oct 13

Nov 10

Dec 8