EEVC NEWSLETTER

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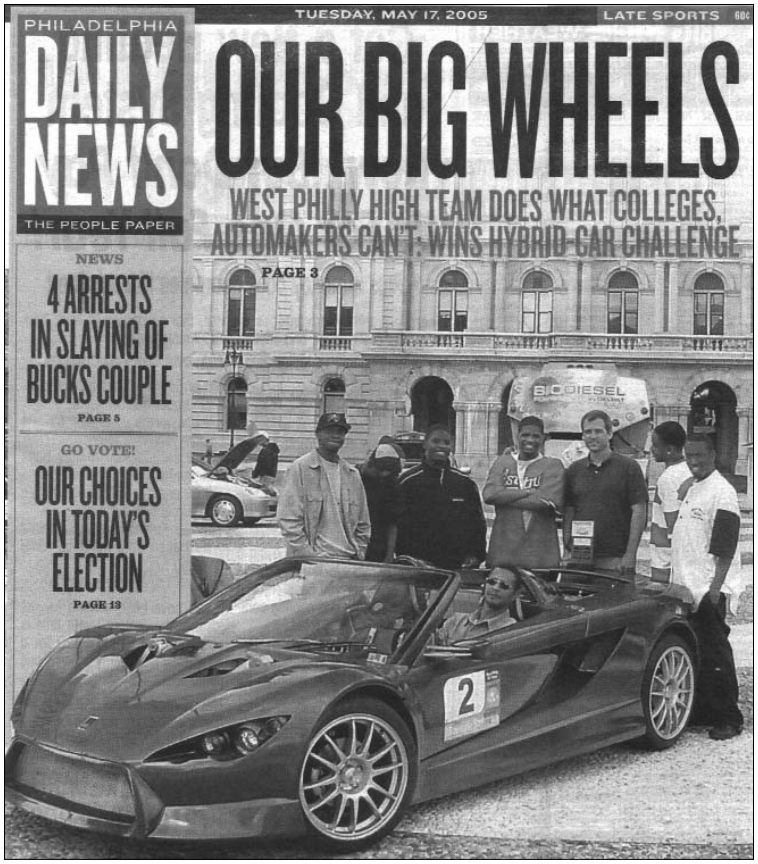
WEST PHILLY HIGH TRIUMPHS IN TOUR DE SOL, SAVES PROJECT

West Philadelphia High School's high-performance hybrid car came in first in points in this year's Tour de Sol, beating out even production vehicles, and in the process saved the school's Automotive Academy from being cancelled. A release from the *Philadelphia Daily News* reports that West Philly Principal Clifton James had proposed gutting the program and using its space for students with disciplinary problems (read: dumping ground). The win in the TdS (and probably the font-page coverage the team got in the *Daily News*) changed all that, and Paul Vallas, the school district's chief executive, announced that the program would remain and might even be expanded.


PHILADELPHIA DAILY NEWS
THE PEOPLE PAPER
TUESDAY, MAY 17, 2005 LATE SPORTS
OUR BIG WHEELS
WEST PHILLY HIGH TEAM DOES WHAT COLLEGES, AUTOMAKERS CAN'T: WINS HYBRID-CAR CHALLENGE
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West Philly High won at the Tour de Sol and saved their school's automotive program in the process.

West philly has shown that good leadership and dedication and enthusiasm from students can lead to remarkable results. Remember that these are kids from the inner city, not pampered suburbanites whose moms drive them in their SUVs. Grit, determination, and hard work have won the day.

The West Philly entry is named the Hybrid Attack because it's based on a kit car called the Attack, built by K-1 Engineering in Slovakia, which comes complete with a welded tubular space frame, suspension, and almost everything else needed for a racing car except the engine.

The West Philly team turned this supercar into a road-coupled hybrid: the front wheels are driven by a 200 hp electric motor from AC Propulsion and the rear wheels by a 100 hp VW turbodiesel running on biodiesel fuel. Overall fuel economy during the event averaged 50 mpg.

And how did it score? 1st Place in its category (Prototype Vehicles – Student Teams); 2nd Place – Low Climate Change Emissions (85% reduction); 10th Place – Fuel Economy (50 MPG); 4th Place – Hill Climb (11 seconds); 1st Place – Autocross (36 seconds); and 3rd Place – Acceleration (10 seconds).

Local teams results

Two other local teams performed well in the Battery Electric Vehicle (BEV) category, Student Teams: Methacton HIgh School's Lorax (the three-wheel Lomax built and contributed to the school by EEVC member John Murphy) and Burlington County County College's Electechs entry The Olympian, running this year without any connection to Cinnaminson HIgh School.

The Lorax took 1st Place in its category, 6th Place for Low Climate Change Emissions (63% reduction), 2nd Place for Fuel Economy (120 mpg), 2nd Place for Range (57 miles), 7th Place in the Hill Climb (14 seconds), and 7th Place for Acceleration (12 seconds)

The Olympian was right behind it, scoring 2nd Place in the category, 8th Place for Low Climate Change Emissions (55% reduction), 4th Place for Fuel Economy (98 mpg), 3rd Place for Range (41 miles), 6th Place for Hill Climb (14 seconds), 5th Place in the Autocross (42 seconds), and 6th Place for Acceleration (12 seconds).

Plug-in hybrid

Valence Technology as well as Energy Control Systems Engineering Inc. (doing business as EnergyCS LLC) in Monrovia, CA entered a "plug-in" hybrid, a Toyota Prius with a much larger lithium-ion battery pack than the normal Prius, and charged with external grid power. It also uses a customer controller built by EnergyCS. On a 150-mile run, the vehicle achieved 102 mpg on the gasoline used, but also used 9 kWh of electricity required to charge batteries, which cost less than $1 to recharge. In electric mode the car can go up to 33 mph (53 kph) without the engine running.

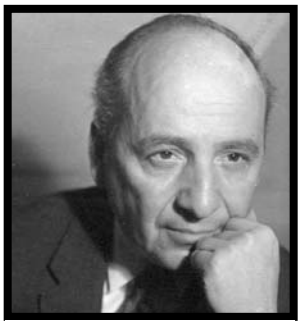
The only drawback to this type of vehicle is the price of the battery pack.

Bassi Sifi wins in e-bike competition

As reported last month, Tony Basiclicato's Bassi Scientific entered the Tour de Sol.

Tony's wife, Anne, took 1st place with the Bassi E-Racer in the one-hour event. Tony placed 3rd with his newly created NEV (Neighborhood Electric Vehicle), the only non-production NEV in the event. Anne's E-Racer was powered by a 1 hp Scott motor which had been run for some 500 hours prior to the event. Anne averaged 14 mph in the extremely difficult hourglass track in competition with Electrathron and solar type vehicles Second place was won by Tony's sons Kurt & Anthony A, in a 3 hour event. This E-Bike ran 35 miles without pedal assistance and still had 50% of its power remaining at the end of the 3 hours; every other EV in the 3 hour event had to be pedaled constantly.

VICTOR WOUK, HYBRID PIONEER



Victor Wouk, 1919-2005. Photo: Blackstone-Shelburne, New York.

Victor Wouk, PhD, visionary scientist and engineer who pioneered the hybrid car, died May 19 at the age of 86.

Victor Wouk was born in the South Bronx in New York City in. 1919. He graduated from Columbia University in 1939, then did graduate work in electrical engineering at Caltech from 1939 to 1942. In 1942, he was recruited to work on the Manhattan Project, and in 1946 he founded his first company, Beta Electric, for making high voltage equipment, which was fol-

lowed by a succession of other companies.

He became interested in electric cars in 1962, at which time he formed Electronic Energy Conversion Corporation. He began working on hybrids in 1970, and worked on them for the rest of his career. The EEVC was honored to have him as a speaker at one of our dinner meetings.

The list of his accomplishments is too long for this space, but perhaps Oliver Perry can be persuaded to write an article. Those of us who had the honor of meeting him will miss him very much.

PHILADELPHIA JUNIOR SOLAR SPRINT 2005
Oliver Perry

On Saturday May 21, 2005 I joined the Philadelphia Solar Energy Association (PSEA) volunteers in the annual Junior Solar Sprint car races conducted on the street along the north side of the Franklin Institute. The day was bright and sunny, perfect for energizing the small rectangular solar panels positioned on each race car. A strong gusty wind played a factor in some cases, catching the panels that were raised perpendicular to the sun rays like a sail in the wind. Most of the time the wind helped more than hindered the cars race along their guide wires over the rubber covered tracks. There were about six guide wire tracks parallel to one another laid in the street by the PSEA volunteers who arrived at sunrise. Winning cars advanced. Double elimination rounds eventually decided the top three fastest cars.

Excited Junior Solar Sprint participants waiting for awards

The Eastern Electric Vehicle Club has been asked each year to assist in judging the entries for technical merit. Three awards for technical merit (in addition to the three top speed awards) are presented by PSEA to the students who design and construct what are judged to be the "best" on the basis of ten different categories. Strength, solar panel alignment, craftsmanship, artistic design, and type of transmission are examples of some of the categories. In addition to the PSEA awards, the EEVC presents an award to the student or students who construct what we feel is the "overall best entry." We consider not only the technical merit of the car but the performance as well. This year we presented the award to the car that finished second in the time trials. The car that finished first was obviously well designed but didn't have quite the overall quality and craftsmanship of our pick.

Approximately 80 cars were entered in this year's event. Of these 80 cars we called back about a dozen for serious consideration for top technical merit. Each student (elementary and junior high level) was provided with the same solar panel and specific electric motor by their school. Most students began preparing for the race in mid April. Their goal was to construct a fast moving vehicle that could carry a 12 ounce soda can powered by only the solar panel (and substitute batteries in case of rain). All entries had to use the same small DC electric motor and had to have at least one hook under the body that would keep the car attached to the guide wire. Choice of building materials, wheels, and transmission between wheels and motor was left to each student.

(l to r): Teacher Amie Abeloff Frankel, students Alex Bohn and David Blumin

The winners of the EEVC award for best overall vehicle were the team of David Blu-

min and Alex Bohn from Cedarbrook Middle School (Cheltenham School District) in Wyncote, Pennsylvania. Their advising teachers were Amie Abeloff Frankel and Beth Kenna, challenge consultants for Cedarbrook Middle School. Cedarbrook Middle School sponsored 24 students; 17 participated in the PESEA Franklin Instituted competition. The students began work in school April 15th. They were given about one hour per week of school time to work on their cars in class.

Much of the work that the winning team of Blumin and Bohn performed was done at home. Alex told me that they began the project by searching the internet for ideas. There are places on line where Junior Solar Sprint cars from past events are featured. The instructors made this information available to all of their students.

According to Amie Abeloff Frankel, the junior solar sprint project requires a great deal of multiple skills, intellectual activity, problem solving, craftsmanship, engineering, and social interaction. All of the students become very enthusiastic in an activity that helps them to develop electrical and mechanical scientific concepts. They also become aware of the importance of material science and tooling that turns raw material into useable parts.

One of the first experiments the team of Blumin and Bohn did was to vary the angle of the solar panel relative to the light to find the maximum amount of power to the motor. This resulted in the use of a ball and socket joint attached between the top of a small support and the solar panel. This arrangement allowed the panel to be tilted in any direction relative to the sun for maximum power during a race.

The final car eventually evolved from about five differing designs. Bohn said that the revelation of holding the motor by mounting the motor tightly between two rail beams dictated the basic platform of the vehicle. The boys determined, on the basis of about three trials, that a small drive gear on the motor, to a large driven on the output axle, delivered sufficient torque for maximum acceleration and racing speed. Their CD disk drive wheels, mounted on a thin axle inserted in a small diameter plastic pipe with bearings on each end provided stable low rolling resistance. Traction was provided with "O" rings slipped over the CD disks like rims on wagon wheels. The plastic wheel hubs holding the axle were neatly and perfectly centered, held by super glue which was fast hardened with a quick cure spray. A nose cone was fashioned to cover the end of the required soda can passenger which lowered air resistance. Holes were drilled in the chassis rails to lighten the body weight.

Alex Bohn's father, a parts maker for a museum exhibit company, helped the boys acquire the materials, parts, and tools for their finely crafted solar sprint vehicle. And, as all good parents, he offered encouragement, support, and advice throughout the construction period.

A recent survey analyzing the role that parents play in the success of their offspring was recently reported in *The Wall Street Journal*. It concluded that in the United States the offspring of successful contributing parents stood the most likely chance of repeating that success.

The fact that our winners came from a good school system and were supported by several teachers labeled "challenge consultants" (in addition to supportive parents) comes as no surprise. Great job everyone!

Finally I must compliment the Philadelphia Solar Energy Association for all of the hard work they do to make the Junior Solar Sprint possible for those in the Philadelphia region. Lisa Rose Bryant is the Junior Solar Sprint Philadelphia Coordinator. She is the reason it happens, the sunshine that empowers us, and the force that keeps it all going. Thanks Lisa Rose Bryant. You make a lot of worthy kids in the Delaware Valley happy come "race day." You reward the right kind of students for the right kind of activity.

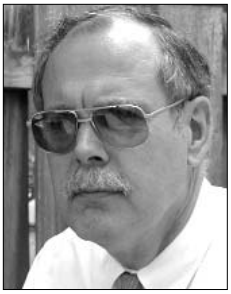
CORRECTION

Last month's newsletter incorrectly reported that Swiss engineering firm ABB builds the Acela train. The Acela is built by Bombardier, Inc., of Canada and Alstom SA of France. We regret the error.

MEETING SUSPENSION

By vote of the membership, meetings will be suspended for the summer. The next meeting will be September 14, at PW High School.

THIS IS LAND-USE PLANNING?
By California Pete



The biggest news here in the Bay area for the past week has been the 2005 United Nations World Environment Day, a five-day conference of mayors from around the world held in San Francisco from June 1 to 5 (no, I don't know why they gave that name to a five-day event).

An important feature of the conference was a "Green Cities Declaration," which called for government efforts to place jobs, housing and recreation within close distance of each other, in the words of the *San Francisco Chronicle*, which has given the event coverage in a five-day special section.

One place in the Bay Area has tried this. Emeryville, a little city (1.2 square miles) next door to Oakland is putting up housing on reclaimed industrial land, and has plans by 2007 to double its number of housing units from the 2000 it had six years ago . One project puts 62 condo units into an area of less than an acre of land once occupied by a paint factory. The place, called Green City Lofts, is a showplace of environmental sensitivity, with foundations made with fly ash instead of cement (let's hope the structural engineers have a good handle on seismic soundness), low-emission interior paint, and even kitchen cabinet doors made out of compressed wheat. A shuttle service is provided to the local BART station. At least one other project follows the same philosophy.

So does that mean that the Bay Area has abandoned sprawl? Not on your life. In an area where the median home price is $622,000, builders continue to convert farmland to suburbs as fast as they can. One recent development puts 512 houses on 104 acres of former rural land in Brentwood, more than an hour's commute from most job centers. Brentwood's population has increased from 23,3002 in 2000 to 40,912 now, while Emeryville has added just 1400 residents in that time.

One of the proposals at the UN World Environment Day called for the mayors to commit to accords that would include having affordable public transportation within a half kilometer of all residents within ten years.

Ain't gonna happen here. With the roads clogged with ever-increasing numbers of cars, public transit in the area has been cutting back service and increasing fares. While there have been some hopeful signs, like the one in Emeryville, the picture continues to look gloomy.

Not all of what's happening on the environmental and energy front is bad news, however, and next month I'll tell you about some hopeful happenings.

NEWS UPDATE

Sodium-sulfur lives

Back in the 1990s there was some interest in sodium-sulfur batteries for EVs, and the Ford Ecostar in the EV display area of the Boyertown Museum of Historic Vehicles used this technology. The problem with the Ns-S battery was that it ran at a blistering 300°C (572°F) and presented a considerable fire hazard.

But Na-S technology may still be valid—just not for cars. The Electric Power Research Institute (EPRI), funded by the nation's electric utilities, is working on a $3 million project that would use Na-S technology developed by the Tokyo Electric Power Company and NGK Insulators Ltd over a ten-year period to demonstrate the technical and commercial effectiveness of a 1.2 MW, 6-hr NA-S storage system in a peak-shaving application for an end-use customer.

GM delivers fuel cell truck to the Army

On April 1 the U.S. Army took delivery of a modified Chevrolet Silverado crew cab pickup equipped with two 94 kW fuel cell stacks, capable of generating 188 kW and 317 foot-pounds of torque, or roughly the motor torque generated

by GM's 5.3 liter V-8 engine. The $3.5 million project was jointly funded by the U.S Government and GM.

According to *Automotive Industries*, the cooling and electronic management systems fill the truck's engine bay, while the fuel cell stacks are mounted between the frame rails underneath the cab and protected by a steel skid plate. The straight-axle rear suspension is replaced by a independent suspension and second electric gear-drive transmission to power the rear wheels.

Three 10,000 psi compressed hydrogen storage tanks, provided by Quantum Technologies, will provide a range of 125 miles, even though the vehicle was not optimized for range.

The Army will evaluate the experimental truck until July 2006 at an Army base in Ft. Belvoir, Va. The vehicle will be used to deliver packages but will not be used in combat. Testing is planned in different climates and locations around the U.S. to assess performance and give the military first-hand experience with hydrogen and fuel cells.

Alternate fuel TV series slated

TV producers Coyote TV of Glendale, CA has cleared a series on alternate fuel vehicles called COOLFUEL ROADTRIP, to be broadcast by the Viacom Television Stations Group, Inc. In Philadelphia that's WPSG (Channel 57). The 18 episode 30 minute series depicts a year-long, 16,000 mile adventure across America, featuring unusual vehicles and alternative fuels.The series is set to premiere the week of September 5.

Some of the vehicles and fuels include:

• An electric hog motorcycle powered by cow-pies and garbage,
• An airplane flying on corn whiskey,
• A 37-foot RV powered by soybeans,
• A 32-foot stretch Hummer Limo powered by solar panels, a hydrogen fuel cell and Cajun food,
• A retro jet turbine-powered pickup truck fueled with vegetable oil, and
• AC Propulsion's T-Zero, the fastest electric car in the world (0-60 in 3.6seconds).

We can't vouch for the cast or the script, but the vehicles sound interesting.

COMING EVENTS

Fuel Cell 2005
June 7-8, Minneapolis. Contact Marsha Hanrahan, marshah@infowebcom.com, or visit www.fuelcell-magazine.com/fc_conf_index.htm.

FedFleet 2005
June 7-9, Nashville, TN. Call 800-315-4333, help@fedfleet.org, www.fedfleet.org.

Power of DC electric drag races
June 11, Mason-Dixon Dragway, Hagerstown, MD. Contact Chip Gribben at futurev@radix.net

2nd International Conference on Polymer Batteries and Fuel Cells
June 12-17, Las Vegas. Call 702.897.3027, dbrodd@broddarp.com, www.electrochem.org/meetings/satellite/pbfc/002/pbfc.htm.

5th International Advanced Automotive Battery (& Ultracapacitor) Conference (AABC-05)
June 13-17, Honolulu. Contact Advanced Automotive Batteries, 530-692-0140, info@advancedautobat.com.

2005 SAE Future Transportation Technology Conference
Sept 7-9, Chicago. Co-located with the 2005 IEEE Vehicular Power & Propulsion Conference. For information call 724-772-7131, or go to meetings@sae.org.

2005 Fuel Cell Seminar
Nov 14-18, Palm Springs, CA. For information call 202-973-8671, fuelcell@courtesyassoc.com, www.fuelcellseminar.com.

MEETING SCHEDULE

Meetings are held in Room 35, Plymouth-Whitemarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m. Note that the next meeting will be September 14, as meetings will be suspended over the summer.

September 14

October 12

November 9

December 14