



EEVC NEWSLETTER

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OHIO STATE SETS WORLD EV SPEED RECORD

From Ohio State U.:

On August 24 professional driver Roger Schroer guided the Ohio State Venturi Buckeye Bullet 2.5 to an average two-way speed of 307.7 mph on the Bonneville Salt Flats, beating the previous 245 mph world land speed record for battery electric vehicles, which was set in 1999

by White Lightning, driven by Pat Rummerfield at a speed of 245.95 mph.

Built by a team led by Ohio State engineering students, the lithium ion battery powered car is pending certification by the Federation Internationale de l'Automobile, the worldwide motor sports governing body. The vehicle is classified under Category A (Special Automobiles), Group VIII (electrical Engines).

During testing the car hit 320 mph, but a



The Ohio State Buckeye Bullet at speed on the Bonneville Salt Flats

failed clutch (too much torque from the motor ripped apart the half-inch steel teeth that connect the motor to the gearbox), despite an all-night effort at repairs, prevented another run that would have confirmed that, so the team had to content themselves

with 307.7 mph.

The Bullet 2.5 uses the same body and chassis as the hydrogen fuel cell powered Buckeye Bullet 2, and nearly the same electric traction system, but it is powered by a 600+ kW A123 Systems lithium-ion battery pack that was designed, tested and assembled by the Bullet team and A123 Systems. The team is supported by French electric vehicle manufacturer Venturi Automobiles, which lends its 10-year expertise in electric vehicles and significant sponsorship funding to the

students.

The Buckeye Bullet 2, powered by hydrogen fuel cells, in 2009 set an FIA-certified world record of 302.877 mph for the fuel cell class. While the original battery-powered Buckeye Bullet set a national record at 314.9 mph in 2004, this record did not meet FIA specifications. That team did, however, set a certified record of 132.129 mph in 2007.

ADAPTING TO CURRENT CONCERNS **Oliver Perry**

I was recently reading an article written in a Penn State publication called *AgScience Magazine* that stated that “a billion people around the world are hungry and seven million children die of malnutrition every year as the human population increases. People say it is because of war, poverty, AIDS, all kinds of social inequalities. But the fact is people in developing countries aren’t getting good crop yields.”

In Africa farmers are only getting 5 percent of their crop yield. Paddy rice in many developing countries only yields 20 percent of its potential. This limited agricultural output exists despite the so-called Green Revolution, which saw massive increases in productivity following World War II and the 1960’s development of high yield hybrid crops, synthetic fertilizers, and more advanced irrigation systems. But even these improvements are seeing constraints due to limited natural resources. Dwindling reserves of oil and natural gas used in the manufacture of inorganic nitrogen fertilizer, along with increased costs of extracting these fossil fuels, are pushing up the price of fertilizer. Phosphorus fertilizer comes from mined ore, another dwindling nonrenewable source. At current rates of use we’re going to run out of phosphorus before we run out of petroleum.

From a trade journal called *Metal Finishing*, April 2009, I read that in today’s competitive market consumers require higher quality products than ever before, especially in the automotive and electronic fields. But many of the metals and metal alloys found to be exceptionally useful in manufacturing key components of our advance machines are

being limited and even banned by higher EPA standards around the globe. What chemicals should be banned and what will the industrial and economic impact be if they are banned?

And as we all know, a major concern everyone has world wide is creating greater economic prosperity by producing more good paying jobs. How much attention should be given to creating jobs detrimental to the environment? Is it possible to have our cake and eat it too by producing jobs that provide both economic prosperity and a safer environment? The latest articles on going green in the marketplace indicate that in general “green” is more expensive and produces fewer jobs overall.

Do all countries have sufficient resources to improve their conditions without at the same time harming someone else? Globally speaking can everyone prosper?

As I have “knocked about” with a wide range of individuals throughout the summer, I sense that many of our neighbors, friends, and relatives do not feel that the typical electric car enthusiast provides a viable solution to major worldly concerns such as those discussed above. Simply put, they feel that there are far more genuine concerns in the world than increasing the number of electric vehicles and hybrid cars coming (or not coming) to the marketplace.

Some of us act and speak as if we are saving the planet through our electric car advocacy. Electric car enthusiasts are not perceived to be the same as antique car collectors or Corvette Club members who seem to go about their business rather quietly. Antique car club members are not pushing everyone to have an antique car in their driveway, nor are Corvette Club members pushing to have every major car company influence the rest of us to buy a high performance sports car. These organizations are not seeking large audiences or public acceptance. They appeal to a select audience and do not appear to be beating the bushes for more members.

It is one thing for like minded people to form a like minded flock but quite another for a particular group to attempt to force its value system on others. Electric car enthusiasts tend to be perceived as moralists (with a

twisted outlook) imposing their opinions on others. Or in many cases, the EV owner is thought to be a nerd who exists in his or her own world, disconnected from reality, something like the professor in the movie *Back to the Future*. Hopefully you and I are not perceived in this light.

It is my belief that EEVC members should be recognized as objective individuals who provide factual information regarding electric vehicles and who are happy to help anyone improve their appreciation of and understanding of electric transportation. Should we be attempting to get more individuals to include an EV in their garage, or should we be content to exist as a source of information and help for the few who for various reasons want to drive an EV? I am suggesting more the later view than the former.

Whatever our view of the place electric cars should have in our transportation sector, we must not forget that there are other more pressing concerns in our world than the advancement of electric cars. Technology is interesting and of great importance in our world. Most people are interested in new technology and therefore interested in learning more about electric and hybrid cars. But forcing new ideas and the adaptation of hybrid and electric cars upon people with the fervor of a religious evangelist may not be the best way to advance electric car production. If promoting the electric car becomes our most important concern we have lost touch with humanity. It is okay for us to look up from under the hood of our electric car and drop a few dollars into the Salvation Army kettle even if the kettle is transported by a gas guzzling truck. We must adjust our behavior to current concerns. The electric car is not the answer for the major problems facing our world. Most people do not believe that the electric car is even a solution for energy independence. If we live among our friends and neighbors with the perspective that there are more important concerns in life than producing electric cars it will be easier for us to get a fair hearing.

Objectively speaking, many of us are beginning to advocate that electric cars MAY be a PART of the OVERALL energy solution and we acknowledge there are more pressing concerns in our world than simply producing

electric cars. In the mean time we rest in the fact that real answers and real solutions eventually do win out over hyped ones in the scientific and engineering world when given time. If our electric cars do not become convincing enough on the streets to sell the public on their worth then we must go back to the labs and improve them until no more argumentation is needed. EVs have a price, they have a place, and they have a future. For that we exist.

WIN SOME, LOSE SOME By California Pete



California has long prided itself on being the most environmentally conscious place around (I wouldn't say "green" this time of year — the hills covered with dead grass and the occasional whiff of smoke reminds us of the season), but the state's efforts to pass legislation to that effect have had mixed results.

In the Win (maybe) column we can put the passage by the legislature of a bill mandating utility-scale energy storage. According to *Greentech Media*, the bill "requires the California Public Utilities Commission (CPUC) to open a proceeding to determine the appropriate targets for each load-serving entity to find cost-effective and viable energy storage systems, by March 1st, 2012. Further, AB 2514 sets a deadline of October 1st, 2013 for CPUC to adopt an energy storage system procurement target to be achieved by each entity by December 31st, 2015 and a second target to be achieved no later than December 31st, 2020."

The bill must be signed by the governor before Sept. 30 to become law. What he will do is as yet unknown.

Also in the Win column is the approval by the California Energy Commission of the 250 Mw Beacon Solar Energy Project, a solar thermal plant using curved mirrors to be built on the western edge of the Mojave.

"California hasn't issued a license for this kind of big 'solar thermal' power plant in

about 20 years,” says the *San Francisco Chronicle*. “But in the coming months, the energy commission will vote on eight other, large-scale solar projects that the state needs to meet its renewable energy goals.”

The acceleration of the approval process can be attributed to the deadline in the economic stimulus package, the *Chronicle* continues. “Renewable power projects that secure all their permits and start construction by the end of this year can receive a federal grant worth 30 percent of the project’s cost, in lieu of taking a tax credit of equal value.”

In the Loss column is the defeat in the state senate of a bill to ban plastic bags at grocery stores. San Francisco already has one, but the state won’t. Environmental groups had backed the bill, but organizations like the American Chemistry Council opposed it, citing hundreds of potential job losses among those making the bags.

Also in the Loss column, *Greentech Solar* reported on September 1 that the state legislature failed to pass a bill “that would have required California public utilities to obtain 33 percent of their power from ‘new renewables,’ i.e., solar, wind, geothermal, and biomass, but not large-scale hydroelectric dams. Debate was proceeding on a companion bill when August 31 turned into September 1 and the session ended.”

The governor, who backed the bill, may still call the legislature into special session.

Costly rules to hit truckers

From *OregonBusiness* comes a story by Cory Mimms that reports on a set of California regulations due in January that will have a big price for truckers going south from Oregon.

The regulations, from the California Air Resources Board (CARB), are intended to cut greenhouse gas and particulate emissions. One requires that many diesel trucks be retrofitted with particulate filters, at a potential cost of \$10,000 to \$31,000 each, using CARB’s own figures, the article says. They add \$250 to annual maintenance expenses and cut fuel economy by 2 percent.

“The regulations have a combined national economic impact of \$17 billion,” says the article.

NEWS UPDATE

100 mpg car goes from Canada to Mexico

Goodyear reported on September 1 that Craig Henderson, of Bellingham, WA, had driven his custom-built car, the Avion, more than 1400 miles from Canada to Mexico on one tank of gas, achieving a documented 119.1 miles per gallon, using 12.4 gallons of fuel from start to finish. The trip, from near Blaine, WA to the Mexican border near Chula Vista, CA included stops for food and overnight lodging, but no refueling.

One factor that Goodyear touts for the accomplishment was Henderson’s use of Goodyear Assurance Fuel Max tires, which feature a low rolling resistance tread compound that helps reduce energy loss as the tires roll. The company estimates that this can save average motorists 2600 miles worth of gas over the 65,000 mile life of a set of tires.

The car, built by Henderson and co-designer Bill Green in 1984, has set previous records but never moved to production. The current version of the Avion is powered by an 800 cc diesel engine.

“The Avion has achieved 113 miles per gallon at 55-60 miles per hour in testing. For this journey, we averaged around 55 miles per hour and contended with regular traffic volumes,” said Henderson.

EV battery prices falling

Greentech Media reported on August 31 that unusual circumstances are leading to “massive discounts” for lithium ion batteries.

“Better Place, the company currently building car-charging and battery-swapping networks in Israel and Denmark, is purchasing batteries for cars at \$400 per kilowatt hour for delivery in early 2012, according to company executives,” says the report. That compares to the \$1000 per kw they cost two years ago.

The article quotes a suggestion by Dr. Wilfried Wilcke, senior manager of nanoscale science and technology at IBM that the price decline is likely not due to technical improvements, but simply to increases in production volume. The article further notes that “the Department of Energy has set a goal of getting batteries for cars down to \$250 a kilowatt hour.”

President visits WI battery plant

An August 17 AP story reported that President Obama visited battery and fuel cell maker ZBB Energy Corp. in Menomonee Falls, WI. Obama “told workers he’s glad to see clean-energy manufacturing jobs here in the U.S. instead of overseas. He says he wants cars of the future to have engines and batteries all stamped, ‘Made in the United States.’”

New electric bus

On August 31 *Greentech Media* reported that Foothill Transit, a public transportation agency serving San Gabriel and Pomona, CA has purchased three 68-passenger “EcoRide BE35 all-electric buses and two charging stations from Proterra. If the initial launch goes well, Foothill may expand to a fleet of 12 electric buses. San Antonio will also soon put Proterra buses on its streets. Contracts with transportation agencies in North and South America may follow by the end of the year.”

“The buses on the Foothill circuit will have 72-kilowatt-hour battery packs,” says the story. “That’s just 50 percent bigger than the one in the two-seater Tesla Roadster (53 kilowatt hours),” and enough for three hours of operation. Charging is expected to take ten minutes every hour.

Costs were high — “the three buses and two chargers Foothill bought cost \$5.6 million,” — but the company expects lower maintenance costs.

Noisy Priuses

The news is out, and it’s bad news for people who long for peace and quiet, but perhaps good news for the blind. An August 24 story by AP business writer Yuri Kageyama reports that the third-generation Prius in Japan will be available with a \$148 option: a special exterior noisemaker. The device emits a whirring sound that is clearly audible on a quiet street and is designed to make pedestrians aware of the otherwise-quiet vehicle’s approach — which should be especially helpful to the blind, who listen for the sound of approaching cars before attempting to cross the street.

The story says that the noise can be turned off manually, but is automatically re-activated whenever the car is started.

Solid state batteries for EVs?

Greentech Media reports that a couple of startup companies are proposing solid-state batteries for electric cars. The first mentioned is Planar Energy, of Orlando, FL, which “claims it has come up with a formula for a crystalline battery that can boost performance, cut costs, make it easier to erect factories and ultimately pave the way for things like inexpensive, mass-manufactured electric cars that can run on the same battery pack for years.”

“In Planar’s batteries, the anode, cathode and separator/electrolyte are crystalline, inorganic solids that get sprayed onto a substrate.”

“By contrast,” the article continues, “Prieto wraps silicon nanowires generated via electrodeposition in an organic polymer that then gets surrounded by a cathode matrix. Nanowires increase the active surface area for transferring electrons between the anode and cathode for rapid power delivery. Satki3 is deliberately cultivating an air of mystery, but check out the video anyway.”

If the companies are successful they should be able to reduce battery pack size significantly, and cut the cost at the same time.

Chinese EV standards

An August 19 story by AP business writer Elaine Kurtenbach reports that a group of state-owned car makers and others have “set up an electric vehicles association in its latest effort to encourage wider commercialization of the costly technology.”

The aim, says the article, is to aid the government in gaining greater control over technical innovation and EV development. “It also could enable automakers that lack the wherewithall to launch electric vehicles on their own to benefit from collaboration with state companies that dominate battery making and electricity distribution.”

A really long EV race

A *Bloomberg News* story printed in the *San Francisco Chronicle* reported August 17 on a race for zero-emission vehicles that began in Switzerland and will run 18,650 miles over more than 80 days to San Francisco. “The teams plan to converge on Cancun,

Mexico, in time for the U.N. climate conference in November,” according to the article.

It’s called the Zero Race, and all vehicles “are required to carry two passengers and drive at least 155 miles at an average speed of 50 miles an hour.” For more information on the event go to www.zero-race.com.

Electric helicopter

Greentech Media reported on August 20 on a project at Sikorsky Innovations (part of United Technologies) to build an electric helicopter. The brainchild of Chris Van Buiten and project manager Jonathan Hartman, Project Firefly aims to come up with a flyable machine later this year; the version at the moment includes two 454 A-hr, 1100-lb lithium ion battery packs and specially modified motors from U.S. Hybrid normally used in trucks and street sweepers (changed from liquid to air cooling), all in a S-3000 CTM helicopter.

COMING EVENTS

63rd International Motor Show 2010

Sept.23-30, Hanover, Germany. Go to www.iaa.de/index.php?id=besucher&L=1

Altwheels Fleet Day

Sept 27, Framingham, MA. For information go to www.altwheels.org.

AltCar Expo and Conference

Oct 1 and 2, Santa Monica, CA. Go to www.altcarexpo.com

NHA Hydrogen Conference and Expo

Oct 13-19, Washington, DC area. Go to www.hydrogenconference.org/

SAE Convergence 2010

Oct 19-20, Detroit, MI. For info go to www.sae.org/convergence

eCarTec München

Oct 19 - 21, Munich, Germany. Go to www.ecartec.eu/

Southern Electric Vehicle 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

World Energy Engineering Congress

Dec 8-10, Washington, DC. Go to [\[gycongress.com\]\(http://gycongress.com\)](http://www.ener-</p></div><div data-bbox=)

Green Truck Summit

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

Solar 2011

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

11th Challenge Bibendum

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

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.

Oct 13

Nov 10

Dec 8

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