



EEVC NEWSLETTER

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A REVIEW OF 21ST CAC RESULTS

The 21st Century Automotive Challenge began on Friday, April 28 as vehicles arrived from all over to register and connect to the MorningStar home.

The following day was devoted to lifestyle efficiency, display and utility events. The morning included tech inspection, public display, cargo, and a tailgating competition. The afternoon and evening featured the highway range event.

Sunday, April 30 began like the previous day, with charging and refueling. followed by tech inspection, public display, cargo, and a tailgating competition. The big event for the day was the autocross, which was run on a course set up by representative of the Central Pennsylvania chapter of the Sports Car Club of America (SCCA). Drivers were walked



Ken Barbour on his Zero electric motorcycle taking first place in the autocross. Photos: Oliver Perry

around the course to familiarize them with it.

The SCCA then set a time reference with a high-performance pace car.

Entrants were allowed multiple runs around the track, with time recorded for the best run. Here are the EEVC entrants, in reverse order

of finishing, as shown in <https://vimeo.com/216315058>.

The Methacton High School three-wheel Lorax, which was also the oldest vehicle in continuous competition, turned in a time of 58.050 seconds on its sixth run.

Next was Jim Natale in his plug-in Prius V-AT, who turned in a time of 50.061 seconds for 4th place.

Alan Arrison, in his Chevy S-10 pickup, did the course in 41.597 seconds, with consider-



The Penn College Fiero came in second.



Alan Arrison was third with his S-10 pickup.



Jim Natale was fourth with his Prius V-AT.



The Lorax, from Methactorn High School, was fifth.

able tire squealing, and earned third place.

A close second place was claimed by Penn College and their Pontiac Fiero EV conversion, which came in with a time of 39.598 seconds.

The winner (as in previous years) was Ken Barbour on his Zero electric motorcycle, with an elapsed time of 39.439 seconds.

Kudos to Dr. Joel Anstrom, PhD, Director of the Hybrid and Hydrogen Vehicle Research Laboratory (HHVRL), Larson Pennsylvania Transportation Institute at Penn State Main Campus, who was the driving force behind the event at the university. And thanks again to Ollie Perry and Jim Natale, for putting together the EEVC part and publishing their observations.

RANDOM ITEMS OF INTEREST Oliver Perry

From *The Green Energy Times*, Issue 43, April-June 2017, www://greenenergytimes.org

Thousands of Jobs Available

By George Harvey

One of the most interesting videos I have recently seen is “Climbing Wind Turbines for a Living That’s Amazing,” <http://bit.ly/wind-technician-video>, produced by the Weather Channel. In it Jessica Kilroy, who describes herself as a “blonde chick,” talks about her job. The video is filled with pictures of her doing work, dangling from ropes at the tip of the blade of a wind turbine.

According to a report recently published by the Environmental Defense Fund, wind turbine technician is the fastest-growing job in the United States.

“Solar and wind jobs have grown at rates of 20 % annually in recent years and each are creating jobs at a rate 12 times faster than that of the rest of the economy.

How Has Going Electric Changed Our Lifestyle?

By Barb and Greg Whitechurch

Short answer: it hasn’t. One year ago we bought a 2008 Toyota Prius with 10k miles for \$6,600. Last October we bought a 2015 Nissan Leaf with 33k miles for \$12k.

The Prius is now our truck, carrying 300

board feet of eight foot cedar or 10-foot lengths of pipe with the hatch closed. While the Leaf can take 10-foot lengths of tubing as well, its interior is not bulk-load friendly.

We use the Leaf for 95% of our driving needs. This covers any excursion less than 75 miles in our Vermont winter. Compared to gasoline engine cars our Leaf has: an enormous amount of torque, extra instant power at any speed, it's non polluting, it is very quiet, and it never fails to start even on the coldest mornings. And, no warm ups are needed as in gasoline engine powered cars.

We marvel at both cars' abilities to climb our steep driveway when it is icy and covered with 6 inches of snow. There is no need to downshift in either car to make adjustments for the terrain.

There 158 charging stations in VT. (Drive-ElectricVT.com/)

Barb and Greg Whitchurch are board members of VT Passive House and owners of a passive house in Middlesex, VT <http://bit.ly/2nRCdGL>

Windmills are Beautiful

By Lindsay Miller

In 2012, fourteen projects were purposed in VT that included 400 foot tall wind turbines that would generate electricity varying from 100 kilowatts to 100 megawatts of output. Some of these have continued to be fully functioning wind farms and others ended up as someone's idea and a large controversy.

Back in 2006 East Haven's plan eventually met defeat because of the impact it would have on the bird and bat population.

One of the successes in this controversy was the Sheffield Wind project that opened in 2011 with sixteen 420 foot tall turbines, producing approximately 40 megawatts of electricity. The Lowell Wind Farm, also called Kingdom Community Wind, consists of 21 turbines producing 63 megawatts.

Proposals in Vermont that didn't make the cut, or are still in the works, are projects in Newark, Grandpa's Knob, Poultney, Ira, Waitsfield, and Londonderry. These projects have run into resistance in one form or another, including the claim that they pose an eye-sore driving away tourism.

A 2015 study indicated that Vermont was relying on natural gas for 48.6 % of its ener-

gy needs. Coal was less than 4%. Wind and solar went from 2.1% to 2.4% during that year. (What supplied the other 50%?.. hydro... nuclear... petroleum??)

The writer's opinion is that windmills do not pose as big of an aesthetic threat to VTs beautiful ridgelines as does the continued use of fossil fuels.

Eco-Conscious Residential Lawn Mowing

By the *Green Energy Times* Staff

For robotic mowing the number one pick was Robomow RS622; price up from \$2199. It handles up to ¾ acre and grades of 36% with ease. Go to sleep while your robot cuts your lawn.

For walk-behind mowers the number one pick was the Ego Power Cordless up from \$330.

For riding mowers the number on pick was the Mean Green Nemesis NXR. It has a run time of 2.5 hours and a price (didn't say what it was) comparable to similar gas-powered zero-turn mowers. Will mow up to 5 acres a day

Vermont Leads Nation in Solar Jobs

(Third among the leaders)

By *Green Energy Times* Staff

A new report by The Solar Foundation cites Vermont as a national leader in the solar industry. ranking third for the number of solar jobs per capita. Between 2015 and 2016, solar jobs in Vermont grew by 29%.

UCS Ranks Vermont Second in Nation for Clean Energy Momentum

By *Green Energy Times* Staff

A new report, entitled "Clean Energy Momentum: Ranking State Progress" and published by the Union of Concerned Scientists, highlighted Vermont for its success in developing a clean energy economy. California was first.

Vermont earned top scores in energy savings, electric vehicle adoption, and energy efficient policy.

All in all the reports indicates that the "brave little state" is punching well above its weight class, as it leads the nation with carbon reduction targets, and hangs neck-and-neck with larger states like California in energy efficiency.

NEWS UPDATE

Wind in Wyoming?

In last month's issue we mentioned that Wyoming has had some mixed results in trying to protect its coal industry against the onslaught of wind power ["Wyoming coming to its senses?" p 6], mentioning that several attempts to tax or restrict the use of renewable energy have been defeated in the legislature. One wonders why it is that Texas, a state more closely wedded to carbon than most, has embraced wind power while Wyoming has not. But that may be changing; a May 21 *New York Times* article by Diane Cardwell reports that a Chinese wind farm company has begun to expand into Wyoming and is even setting up facilities to train local residents to work on them, including in aptly named Carbon County. There may be some politics behind this, Ms. Cardwell suggests, but it's still interesting to watch.

Another electric supercar



Last month we told you about the Renault ZOE e-Sport concept car, which gets to 100 km/h (62.5 mph) from standstill in 3.2 seconds thanks to fore-and-aft motors putting out 340 kW (460 bhp). This month's entry is the NIO EP9, which achieved the fastest ever autonomous lap at the Circuit of the Americas Race Track in Austin, Texas. On February 23, the NIO EP9 drove autonomously without any interventions, recording a time of 2m 40.33s (two minutes, 40.33 seconds) at a top speed of 160 mph. The same day, the car also beat the fastest COTA lap time for a production car with a driver, achieving a lap time of 2m 11.30s and reaching a top speed of 170 mph. On May 12 (with a driver on board) it set a new lap record at the Nürburgring Nord-schleife, achieving a lap time of 6m 45.900s.

With four inboard motors and four gearboxes, the EP9 delivers 1 MW (1342 bhp),

accelerates to 124 mph in 7.1 seconds and has a top speed of 194 mph. With an interchangeable battery system, it is designed to be charged in 45 minutes and has a range of 265 miles.

The EP9 is built by China's NextEV, and each one costs about \$1.2 million to build, according to CNN, so there's no telling where this venture will go.

Daimler entering U.S. battery market

The German company is planning to get into the home battery market "through a collaboration with residential rooftop solar installer Vivint Solar Inc," according to a May 18 Reuters story by Nichola Groom. "Daimler will sell the batteries through its Mercedes-Benz Energy subsidiary established last year," the article continues, "bringing its aspirational car brand to the home energy market in much the same way Tesla has with its Powerwall batteries."

Qualcomm demonstrates dynamic electric vehicle charging

Qualcomm Technologies recently demonstrated dynamic electric vehicle charging (DEVC), which allows vehicles to charge while driving. Based on the Qualcomm Halo wireless electric vehicle charging technology, the wireless DEVC system can charge an EV dynamically at up to 20 kW at highway speeds. The company also demonstrated simultaneous charging, in which two vehicles on the same track can charge dynamically at the same time. The vehicles can pick up charge in both directions along the track, and in reverse.

AllCharge technology makes EVs fit for any type of charging station

At the IAA Frankfurt Motor Show in September and at Continental Tech Show in June 2017 technology company Continental will be presenting an answer to the problems posed by the non-standardized charging infrastructure for electric vehicles. The basic idea is simple. Rather than cramming the car with extra technology to match all the different types of charging station, Continental turns the electric powertrain itself into a "charger." Dubbed the "AllCharge" system, the technology is based on the components of

a conventional electric powertrain (comprising electric motor and inverter). Since constant AC/DC switching at different voltages is already an inherent feature of the electric powertrain, these components already possess all the necessary capabilities to function as a charging system. By exploiting these capabilities, it is now able to provide interoperability with different charging technologies using an onboard, vehicle-based solution.

As well as being able to charge their vehicle at any charging station, at an output rate of up to 800 V and up to 350 kW, drivers also have 230 volts of AC power available for onboard use if needed.

SLIP-SLIDIN' AWAY By California Pete



The California coast is like some people: beautiful and unstable. This has led, in recent days, to the resort area of Big Sur becoming even more exclusive than usual. In April the Pfeiffer Canyon Bridge on Rt 1 (the Pacific Coast Highway) north of Big Sur was

damaged by winter storms, and there is no date given for replacing it. Then on May 23 a landslide 1/4 mile wide came down at Mud Creek, about 15 miles or so south of Pfeiffer Canyon, replacing what had been a fairly short but scenic drive between them with a 137-mile trip through the mountains on narrow and twisty alternate roads.

Some people had expressed hope that the big slide would help stabilize the area so rebuilding could begin, but even after the highway is reconstructed and the bridge replaced, it will all happen again. The spectacular coastal bluffs that everyone admires are made of barely-consolidated sand (you can scoop the stuff away with a spoon) and rocks, and will inevitably slide again. Devil's slide, 146 miles up the coast near Pacifica, got so bad the state eventually spent \$400 million to build a tunnel to bypass it. The old section of highway is now a scenic trail.

Meanwhile, the luxurious Post Ranch Inn is transporting guests in and out by helicopter. Of course, who would let a little thing like a landslide get in the way of enjoying the blend of

“rustic elegance with luxury and comfort, offering stunning ocean or mountain views?”

To see it is to want to tax it

A quote attributed to Michael Faraday has him replying to a British politician's question about the use of electromagnetic induction that Faraday was researching, “Why, sir, there is every probability that you will soon be able to tax it.” Apocryphal or not, it captures the essence of politicians. In a similar vein, “The [California] Franchise Tax Board is seeking public comment on its proposal for computing taxes on commercial space transportation companies,” according to a May 3 *San Francisco Chronicle* article by Dominic Fracassa. The Franchise Tax Board insists that this will encourage more space companies, because it will offer certainty about taxes. On the other hand, other states can offer certainty that there will be no taxes.

Sort of reminds me of the lead-up to the Bicentennial celebration in 1976. Philadelphia almost didn't participate because the pols were so busy fighting among themselves about who would get the biggest share of the money to be made that they didn't get around to making the preparations for the event until the last minute.

Let's have more renewables

Last month we mentioned that California has had occasion to shut down (“curtail,” in the jargon of the trade) some solar capacity because it exceeded current demand. That has not stopped the march to renewables, however, and, according to a May 18 piece by Dominic Fracassa in *The Chronicle*, on May 13 the state, with the sun shining brightly and reservoirs brimming from the winter's rains, “renewable sources produced a record 67.2 percent of the electricity on the portion of the state's power grid controlled by the California Independent System Operator. That figure does not include large hydropower facilities, which added another 13.5 percent. Based in Folsom, the ISO runs 80 percent of the state's grid.” It also did not include power from rooftop solar arrays.

Solar has become so important, in fact, that the PUC recently issued a press release asking the public to be prepared to turn off some lights and otherwise reduce electrical consumption by 3500 MW between the hours

of 9:00 and 11:00 a.m. on August 21, because of a partial eclipse of the sun on that date. The alternative would be to fire up natural gas-burning peaking plants, which are expensive and emit carbon dioxide, and the PUC would like to avoid that.

State battery credit?

The missing piece of the solar puzzle is battery storage, and although Tesla and others are selling battery systems to go with solar arrays, they're a bit expensive for most homeowners. "The Tesla Powerwall, for example, costs \$6,200 for the battery and supporting equipment, and installation costs can range from \$800 to \$2,000. Wider use and increased production would probably lower the cost of storage — just as happened with solar panels during the past decade — but for now, the technology remains out of financial reach for many homeowners," says a May 26 article by David Baker in *The Chronicle*. But, Baker continues, the state may be able to help with that. A state legislator he proposed a bill that would make rebates for battery installation more available and the funding for it more predictable. Let's hope.

Preparing for sea level rise

From an article by John King in *The Chronicle* for May 30:

"An ambitious design competition that seeks to make the Bay Area a model for how to prepare for sea-level rise kicks off this week.

"The competition, dubbed 'Resilient by Design,' will select 10 interdisciplinary teams to tackle 10 sites around the bay, with at least one in each county. Each team will focus on a single site and prepare a design response that is intended to be not just visually cool, but scientifically and economically feasible."

COMING EVENTS

2017 Washington DC Electric Vehicle Grand Prix

June 10, Washington, DC. <https://doee.dc.gov/release/2017-washington-dc-electric-vehicle-grand-prix>

American Solar Challenge Formula Sun Grand Prix

July 3-8, Austin, TX. <http://americansolar-challenge.org/>

National Drive Electric Week

Sept 9-17, nationwide. At press time no events were listed for the eastern PA-NJ area; for more information go to <https://driveelectricweek.org/>

12th Annual Altcar Expo and Conference

Sept 15-16, Santa Monica, CA. www.altcar-exposocal.com/

National Drive Electric Week Event

Sept. 16, Vincentown, NJ. For info go to <https://driveelectricweek.org/event.php?eventid=936>

Solar Decathlon 2017

Oct 5-15, Denver, CO. www.solardecathlon.gov

2017 Bridgestone World Solar Challenge

Oct 8-15, Darwin to Adelaide, Australia. Go to www.worldsolarchallenge.org

NOTICE ON DUES

Annual dues are \$20 with electronic delivery of the Newsletter, or \$25 for a printed copy. Make checks payable to EEVC and mail to James Natale, 3307 Concord Dr, Cinnaminson NJ, 08077, or pay via PayPal to www.paypal.me/EEVC.

MEETING SCHEDULE

Meetings (except in the summer) are held in Room 49, Plymouth-Whitemarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

June 4, 7:00 p.m.

Cugini's Pizzeria
1692 Clements Bridge Rd
at Locust Grove Plaza
Deptford, NJ

July 12: TBD

August 9: TBD

September 16

11:00 a.m. to 3:00 p.m. (includes lunch)
Mt. Holly Motorsports
2044 Rt. 206 in Vincentown, New Jersey

October 11