



# EEVC NEWSLETTER

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## CARS AND MUSHROOMS IN KENNETT SQUARE

Kennett Square is famous for its mushrooms and mushroom festival, but there's more to the event than edible fungi. This year the EEVC was invited to show off some of its vehicles. On Saturday, September 12 Alan Arrison arrived with his S-10, Ken Barbour with his Leaf, and Jurgen Balitzky with his Tesla Model S.



*Alan Arrison (l) shows off his S-10 pickup while Ken Barbour poses with his Leaf.*

There were plenty of Model S, Volts, a Tesla roadster, a Mini E, and a Chevy Spark as well.

There was also a full slate of other antique and classic cars, including a 1916 Rauch & Lang electric.

Ken reported after the event that mileage had not been a problem in either direction: "Just in case you were curious how



*Cars lined up for the event*



*Jurgen Balitzky's Model S*



far the Leaf can go under normal conditions. Trip involved rt 295, us 322 and rt 1. No problem for the Leaf, Al's S-10 or Jurgen's Tesla of course."

### **IRENE KREIBICK, 1926 – 2015**

Irene Kreibick, mother of long-time EEVC member Ed Kreibick, passed away peacefully on August 28, 2015 at the age of 89.

Born in the Feltonville section of Philadelphia, she was the daughter of the late Edna and Fred McKendry. Proceeded in death by six brothers ; Fred, John, George, Francis, William and Edward, and one sister, Edna. She is survived by one brother, Oliver.

She was the loving wife of the late Edward Kreibick, beloved mother of Edward F. and wife, Beverly. She is survived by 3 grandchildren – Edward, Brian and James, and 4 great grandchildren - Patrick, Jakob, Katarina and Clara.

She lived in Mount Dora, FL from 1987 to 2002, returning to Warminster, Pa then enjoying life at the Wesley Enhanced Living community. She was an active volunteer at the Ben Wilson Senior Center in Warminster for many years.

### **SETTING THEM STRAIGHT IN WISCONSIN**

Pete Gruendeman responded to an item in the August Newsletter ("Attention cheapskate EVer: The feds are out to get you!"), that discussed the federal DRIVE act, which proposed new fees to be charged to EVer in lieu

of gasoline taxes. The act has since been passed by both House and Senate, but has not as yet gone the the president.

To read the text of the DRIVE act, go to [http://www.epw.senate.gov/public/\\_cache/files/7311e4f6-04eb-43b1-a5c2-7586dee4e805/edw15730.pdf](http://www.epw.senate.gov/public/_cache/files/7311e4f6-04eb-43b1-a5c2-7586dee4e805/edw15730.pdf)

Here is Pete's response, including a letter he sent to the editor of his local paper:

"I chuckled when I read your description of the 1,300 page DRIVE act [actually it's 1030 pages – ed] , requiring users of roads and bridges to pay their fair share. That is so not gonna happen in the US. The reason why is that the heavy trucks wear and break down roads far more than what they pay for in fuel taxes. Pasted below is a letter to the editor I wrote which was published in the La Crosse Tribune, in November of last year. I cite our roads commissioner who claims that the heavies wear the roads considerably more than cars. I encourage you to publish it in the EEVC newsletter if you think it clarifies the situation in regards to fair taxation of vehicles using public roads. See below.

Letter to the Editor, by Pete Gruendeman, Town of Barre, WI

My Prius gets nearly 50 mpg on average. Wisconsin state gasoline taxes are 32.9 cents per gallon, so I am paying about 2/3 of a cent per mile in gas taxes. On Feb 7th, 2013, on the Wisconsin Public Radio program Newsmakers, Ron Chamberlain, the La Crosse county highway commissioner stated: One quad axle dump truck, loaded to the legal maximum weight, equals the road wear of 9,600 cars. You can hear him at [www.wpr.org/listen/38546](http://www.wpr.org/listen/38546), 11 minutes in.

If 2/3 of a cent per mile isn't enough tax money for my Prius using the roads, then \$64.00 per mile (2/3 cent times 9,600) isn't enough tax money from a quad-axle dump truck. I await your proposal on how you plan to collect this money from the heavyweight users of our roads. We know that will never happen. We privatize the profits in the US and we socialize the losses. The proposed \$50 fee on hybrid and electric cars is socializing the losses onto the users who aren't wearing out the roads.

Pete Gruendeman  
Town of Barre

## NEW EV FROM PORSCHE



Last month we showed Audi's new electric concept car, the e-tron, which was to be shown at the Frankfurt Auto Show. Now Porsche has joined in, with a car aimed straight at Tesla.

Called the Mission E, the concept car, to be unveiled at the same show and billed as a four-door sports car, shows some interesting advances: how about an 800-volt propulsion system, 600 hp (440 kW), 500 kilometer (312 mile) driving range, and 15 minutes charging time to 80 percent? That's combined with all-wheel drive and all-wheel steering.

Power comes from a pair of permanent magnet synchronous motors that get the car up to 100 km/h in less than 3.5 seconds and to 200 km/h in under twelve seconds. The need-based all-wheel drive system with Porsche Torque Vectoring — which automatically distributes torque to the individual wheels — transfers the drive system's power to the road, and all-wheel steering gives precise, sporty steering in the desired direction. The car's lap time on the Nürburgring Nordschleife race track is under the eight-minute mark.

There are, of course, a fair number of "because we can" features. An eye-tracking system detects, via camera, which instrument the driver is viewing. The driver can then activate the menu of the instrument in focus by pushing a button on the steering wheel and navigate in it — which also involves an interplay of eye-tracking and manual activation. The display follows the seat position and body attitude of the driver; if the driver sits lower, higher or leans to one side, the 3D display of the round instruments reacts and moves with the driver. This eliminates situations in which the steering wheel blocks the driver's view of certain key information, for instance. All relevant information such as vehicle speed is always within the driver's line of sight.

## NEWS UPDATE

### Solar power activity high

On August 24, according to *The New York Times*, "[t]he Obama administration ... announced a slew of small measures designed to encourage the use of solar power hours before President Obama was scheduled to fly to Nevada to speak at the National Clean Energy Summit there.

"The measures included making an additional \$1 billion in loan guarantee authority available in an existing federal program for innovative versions of the kind of residential rooftop solar projects that have become popular in places like California. But none of the announced measures would provide the impact on the solar industry of the Clean Power Plan, which was announced this month and requires states to cut carbon emissions by an average of 32 percent. That plan provides strong incentives for much of those reductions to come from the development of renewable energy resources — exactly what executives at the conference in Nevada are looking to sell.

"Despite the attention showered on solar power, it still provides less than 1 percent of the electricity generated in the United States. In 2014, renewable energy sources provided 13 percent of the nation's electricity — about half of which came from hydroelectric dams, a third from wind and just 3 percent from solar, according to federal data.

"But the price of solar power dropped 78 percent between 2009 and 2014 while the price of wind power dropped 58 percent during that same time period. Wind is now among the cheapest sources of power in the United States, with solar not far behind. The development of hydraulic fracturing, a form of drilling that efficiently releases natural gas, has also led to a rapid increase in the amount of natural gas generated in the United States and a plunge in its price.

"As a result, 90 percent of the electrical generating capacity added in the United States between 2012 and 2014 was either natural gas, wind or solar, according to Matt Stanberry, vice president of market development at Advanced Energy Economy, a trade association."

### **Better understanding of photosynthesis**

Recent experiments at the U.S. Department of Energy's Argonne National Laboratory have provided a greater understanding of how to manipulate photosynthesis, putting humankind one step closer to harvesting "solar fuel," a clean energy source that could one day help replace coal and natural gas.

Lisa M. Utschig, a bioinorganic chemist at Argonne for 20 years, said storing solar energy in chemical bonds such as those found in hydrogen can provide a robust and renewable energy source.

Researchers attached a protein from spinach to both a light-absorbing molecule (called a photosensitizer) and to a hydrogen-producing catalyst. The protein helped stabilize both the catalyst and photosensitizer, allowing scientists to observe direct electron flow between the two for the first time.

Argonne has been studying photosynthesis since the 1960s but this particular experiment has been pursued for about a year. Soltau said scientists may be several years from using these techniques to generate storable solar fuels to power cars or households, but that this could be made possible once researchers learn ways to make the process more efficient.

The scientists' findings were published in a paper titled "Aqueous light driven hydrogen production by a Ru-ferredoxin-Co biohybrid" in the journal *Chemical Communications*.

### **Improved solar charging of lithium batteries**

Researchers at Case Western Reserve University have wired four perovskite solar cells in series to enhance the voltage and directly photo-charged lithium batteries with 7.8 percent efficiency—the most efficient reported to date, the researchers believe.

The researchers say their overall photoelectric conversion and storage outperformed all other reported couplings of a photo-charging component with lithium-ion batteries, flow batteries or super-capacitors.

Perovskite solar cells have active materials with a crystalline structure identical to the mineral perovskite and are considered a promising new design for capturing solar energy. Compared to silicon-based cells, they convert a broader spectrum of sunlight into electricity.

In short order, they have matched the energy conversion of silicon cells, and researchers around the world are pursuing further advances.

Dai's lab made multilayer solar cells, which increases their energy density, performance and stability. Testing showed that, as desired, the three layers convert into a single perovskite film.

By wiring four lab-sized cells, about 0.1 square centimeter each, in series, the researchers further increased the open circuit voltage. The solar-to-electric power conversion efficiency was 12.65 percent.

To charge button-sized lithium-ion batteries, they used a lithium-ion-phosphate cathode and a lithium-titanium-oxide anode. The photoelectric conversion and storage efficiency was 7.8 percent. Through ten photo-charge/galvanostatic (steady current) discharge cycles lasting nearly 18 hours, the technology maintained almost identical discharge/charge curves over all cycles, showing high cycling stability and compatibility of the components.

### **Diminishing returns from wind energy**

Wind turbines are frequently put up in "wind farms," with anywhere to a few to a few hundred spaced fairly closely together. This is generally done to maximize output and minimize land use. But do the wind turbines affect each other? If they do, it could mean there is a practical maximum density of turbines that can be installed in one area.

Atmospheric science professors Nate Brunzell and David Mechem in the University of Kansas Department of Geography are co-authors of a new study just published in the *Proceedings of the National Academy of Sciences* by an international research group that evaluated the effects of large wind farms on atmospheric flow and its implications for how much renewable energy the turbines can generate.

"Wind turbines generate electricity by removing energy from the wind, so a larger number of wind turbines should result in a slowdown of the winds in the lower atmosphere," Mechem said.

The researchers quantified this phenomenon in numerical simulations by applying a sophisticated model normally used for

weather forecasting to one of the windiest regions of the United States.

The team found that a slowdown effect triggered by wind turbines is substantial for large wind farms and results in proportionally less renewable energy generated for each turbine versus the energy that would be generated from an isolated wind turbine.

While the researchers stress that no current or planned wind farm approaches the size or concentration that would cause the slowdown effect, their results suggest the phenomenon tied to large wind farms needs to be accounted for in future planning of wind energy.

“When just a few wind turbines are installed, each additional turbine results in a similar increase in electricity generated, as you might expect,” Brunzell said.

However, when a substantial number of turbines are installed over a small area, the amount of electricity generated is no longer governed by simple multiplication, according to the researchers.

“Instead, because the turbines extract energy from the wind, additional turbines will each generate less and less electricity,” Mechem said.

The team’s simulations estimate this slowdown effect results in a practical upper limit of 1 megawatt per square kilometer that can be generated — far less than previous estimates not accounting for the effect. Current wind farms are operating well below this generation limit, but the authors found that this slowdown effect needs to be accounted for, particularly when comparing different sources of renewable energy.

### **GUEST SPEAKER FOR NOVEMBER MEETING**

The November meeting will feature a talk by Marielle Martin of Penn State, whose presentation is entitled “Analysis of California Senate Bill 1305: the Power Content Label, and its Application to Pennsylvania Electric Vehicle Charging Stations - Support, Opposition, and Recommendations.” Her description of the presentation is as follows:

#### **Issue**

Consumers make decisions based on specific preferences. Regarding electric vehicles

(EVs), decisions on ownership and where to refuel may be affected by fuel choice preferences. However, Pennsylvania does not currently require that energy resource information be available to consumers at EV charging stations. In a state generating large percentages of electricity from coal, nuclear energy, and natural gas, providing this information would enable consumers to make more informed, personally satisfying decisions.

#### **Policy Solution**

California Senate Bill 1305 requires electric utilities to disclose generation resources as percentages of the total generation mix. The percentages are reported to customers via a Power Content Label (PCL), which increases transparency and consumer awareness. The California Energy Commission states that the labels tell consumers “about the resources mix your energy dollars are being spent on.” (California Energy Commission, 2015).

#### **Presentation Focus**

My policy question analyzes the feasibility in applying PCLs from Senate Bill 1305 to Pennsylvania’s EV charging stations. Policy analysis, support, and opposition will be explored, followed by a recommendation.

### **WE’RE ON FIRE By California Pete**



As one might expect, the current California drought, described as the worst in more than 1200 years (with the smallest Sierra snowpack in 500 years, according to analysis of tree rings), has led to devastating wildfires, with tens of thousands of acres going at

a time. The forests are tinder-dry, and many of them are filled with dead trees, killed by bark beetles or just lack of water. And there’s a ready source of ignition: dry lightning, in which a thunderstorm is not accompanied by rain — plus people, of course.

Once one of these fires gets going it spreads, literally, like wildfire. Gusty winds,

either naturally occurring or created by the storm itself, cause embers to fly over the heads of firefighters and ignite new fires a quarter or half mile behind them. Trees simply explode into flames

At last report just one of the 5225 fires reported this season, the Valley fire, in Lake, Napa and Solano Counties north of the Bay Area, had spread to 73,700 acres (115 square miles), devastated the small town of Middletown, destroyed 585 homes and hundreds of other structures, and was at one point threatening about 9000 more. Widespread evacuations have been ordered, 10,000 people have been displaced, and three have been killed.

The Butte fire, in Amador and Calaveras Counties, has burned 70,760 acres and destroyed 252 residences and 188 outbuildings, damaged 17 structures and threatens 6400 structures. Six thousand people were evacuated, although many are now being allowed to return as the fire is contained.

On top of this are the smaller Lumpkin fire, the Walker fire the Antelope fire, and thousands more.

### **Are floods coming?**

You have probably heard me say that California has four seasons: winter and early spring make up the Rainy season; this is followed in summer and fall by the Fire season; then the rains return and give us the Mudslide season, in which the hillsides that were denuded by the fires turn to goo and head for lower elevations. And of course there's Earthquake season, which lasts all year. Dates are flexible, as during the current drought the fire season has expanded to cover pretty much the whole year.

But now we are told that the El Niño phenomenon in the Pacific is becoming especially strong, and will likely produce record rains this winter. This will cause heavy rains and widespread flooding, as the ground, so dry it repels water, will not absorb it quickly. And temperatures are expected to be unusually warm, which means much of the precipitation in the Sierra will fall as rain, rather than snow, and run off instead of being stored in frozen form and released slowly. So let's add Flood season to this year's list.

Sorry not to have anything funny to write about this month.

## **COMING EVENTS**

### **2015 World Solar Challenge**

October 6-13, Australia. Go to [www.worldsolarchallenge.org](http://www.worldsolarchallenge.org)

### **Engine Expo 2015 (with an electric and hybrid pavilion).**

Oct. 20-22, Novi, MI. Go to [www.engineexpo.com/usa/pavilion.php](http://www.engineexpo.com/usa/pavilion.php)

### **Sixth Green Vehicle Convention**

Nov 16-17, Shanghai, China. [www.gvc-annual.com/en/](http://www.gvc-annual.com/en/)

### **SAE 2015 Electric Powertrain Technologies Symposium**

Nov 17, Stuttgart, Germany. Go to <http://www.sae.org/events/epts/>

### **Los Angeles Auto Show**

Nov 20-29, <http://laautoshow.com/>

### **SAE International Vehicle Electric Powertrain Forum**

Dec 3-4, Shanghai, China. Go to <https://www.sae.org/events/vept/>

### **SAE 2016 Hybrid & Electric Vehicle Technologies Symposium**

Feb 9-12, Anaheim, CA. [www.sae.org/events/hybridev/](http://www.sae.org/events/hybridev/)

### **SAE 2016 World Congress & Exhibition**

April 12-14, Detroit. [www.sae.org/congress/](http://www.sae.org/congress/)

## **NOTICE ON DUES**

Annual EEVC dues are \$20 with electronic delivery of the Newsletter, or \$25 for a printed copy. Mail checks payable to EEVC to James Natale, 3307 Concord Dr, Cinnaminson NJ 08077, or pay via PayPal to [jnatalemicro@comcast.net](mailto:jnatalemicro@comcast.net).

## **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 14

Nov 11

Dec 9

Jan 13

Feb 10

Mar 9