

EEVC NEWSLETTER

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PICTURES FROM THE JUNIOR SOLAR SPRINT

This year's Junior Solar Sprint was held June 3 at the GridSTAR Center, Normandy Place in the Philadelphia Navy Yard. Videos of the events can be found at the EEVC Web site, www.eevc.info.

The site links to three interesting videos by Oliver Perry. The first,



Winners of Best Overall at the JSS competition: Left to right: Aiden Brennan, Micah Smith, Arnav Kaushik, and Rohan Metha.

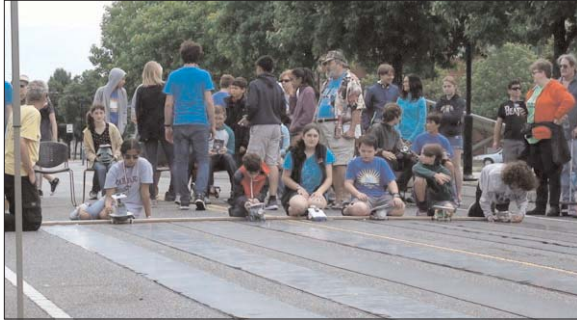
marked 2017 Overview, shows the history of the event, from the first, held 24 years ago in front of the Franklin Institute and run by the Philadelphia Solar Energy Association, to the 2017 event. Included are remarks by some of the long-time participants. Scenes follow of participants



Lisa Rose Bryant, former PSEA president and Jr. Solar Spring coordinator (left) and volunteer Kathleen Maley register the Jr. Solar Sprint entrants.



EEVC members Carl Grunwald (left) and Al Arrison (right) inspect the Jr. Solar Sprint cars for technical merit and innovation.



Cars line up at the start of the race.



Lisa Rose Bryant, former PSEA president and Jr. Solar Spring coordinator (left) and a volunteer, register the Jr. Solar Sprint entrants.



The EEVC Best Car Award

preparing their entries; registering with Lisa Rose Bryant and Kathleen Maley; tech inspection with Alan Arrison and Carl Grunwald, with Vincent O’Grady and Brendon Kitteridge checking for legality; preparation by volunteers from Drexel University, including Con-

nor Sands and Ben Cohen of the Electric Vehicle Racing Team and Talaial Alina of the American Institute of Chemical Engineers; David Woods, to be judged for innovation.

When the time came for the race there was some question as to the amount of sunlight available, and indeed the early events were

run with battery power, but the sun eventually came out, so cars could run on solar power.

The EEVC Best Overall award went to Car #67, from Souderton Charter School. Other links go to two other videos: Students, Parents, Teachers, and Race Volunteers; and All the Racing.

It was encouraging to see the number of girls competing; their increased representation in the JSS, and their increasing interest in STEM (Science, Technology, Engineering and Mathematics) is a hopeful sign.

JUNE MEETING AT CUGINI PIZZA

The June meeting was held at Cugini’s Pizza in Deptford, NJ. A video review of the meeting by Oliver Perry can be found at <https://vimeo.com/221838565>.

Pictures below by Oliver Perry





Comments by James Natale:

The meetings in Deptford bring out the members that won't/can't make the meetings in PA and attract a number of visitors. Jurgen brought his Model S with the blinky lights, Ken & Nick rode their motorcycles, the pair of Model X and the Bolt were also visitors.

The Model X demonstration was an easter egg that flashes the headlights and flaps the doors while blasting the song from the stereo.

The meeting format

People park along the outer edge of the parking lot where they talk about cars or just hang out.

We drift in to the restaurant for dinner (on your own) and more yakking. It is all small conversations as the tables seat 4.

Then we usually get pushed out at 9:00 when they close and hang out in the empty lot.

Cugini's is thrilled to have us and I'm thrilled to meet there as the food is good and reasonably priced. Beats the Hell out of driving through Philadelphia & paying \$4 for the bridge.

REQUEST FOR SURVEY

EEVC President Oliver Perry has asked that this letter be distributed to the membership:

Dear Oliver Perry,

I am an Assistant Professor at Michigan State University in James Madison College, which is a public affairs college, and in Civil and Environmental Engineering. I am working with Dr. Mehrnaz Ghamami and Dr. Annick Anctil in Civil and Environmental Engineering to study new options for the charging of electric vehicles. As part of this project, we are conducting a survey of electric vehicle owners to better understand any challenges they face with charging their vehicle, their opinions about new forms of charging, and their reasons for purchasing an electric vehicle.

I understand that your organization, the Eastern Electric Vehicle Club, supports electric vehicle technology. *We are wondering if you would be willing to share our survey with your membership?* For example, would you be willing to share the link through an email list and/or through social media? The survey for electric vehicle owners can be found [at https://msu.co1.qualtrics.com/jfe/form/SV_6lifbEiFEIGD7RX]. There is also a version of the survey for members of the general public who do not own electric vehicles, which can be found [at https://msu.co1.qualtrics.com/jfe/form/SV_4THUMeAYmHnU1UN]. The surveys take about 15 minutes to complete. Everyone who takes the survey will be entered into a drawing to win a \$100 Amazon gift card.

Your assistance would be of great help to our research. Through lifecycle assessment, public opinion research, and modeling, our research team is committed to developing sustainable options for electric vehicle charging. We hope that the results of our research will be of benefit to your organization and to the promotion of electric vehicles. We would be happy to share the aggregated survey results with you once the research is complete.

Please let me know if you have any questions or concerns. I can be reached at moores60@msu.edu, or 605-484-5450 (cell), James Madison College, Case Hall, 842 Chestnut Road, Room S369L, East Lansing, MI 48825. I look forward to hearing from you.

Sharlissa Moore

Editor's note: We tried the links and had

some difficulty with them. If you can't connect try a different browser.

PREDICTION OF EV SUCCESS

Bloomberg New Energy Finance recently released its annual long-term forecast of the world's electric vehicle market. Entitled "Electric Vehicle Outlook 2017," it predicts that adoption of EVs will pick up more than predicted in the 2016 forecast, with falling battery prices being the main driver. "By 2040, the forecast predicts, "54% of new car sales and 33% of the global car fleet will be electric."

More-detailed predictions include:

- "China, the U.S. and Europe [will] make up over 60% of the global EV market in 2040.
- "Electric vehicles [will] become price competitive on an unsubsidized basis beginning in 2025.
- "Battery electric vehicles (BEV) [will] leave plug-in hybrid vehicles (PHEV) behind.
- "Lithium-ion battery demand from EVs will grow from 21 GWhr in 2016 to 1,300 GWhr in 2030.
- "Electricity consumption from EVs will rise to 1,800 TWhr by 2040 from 6 TWhr in 2016.
- "Fossil fuel demand will be displaced by the growing fleet of EVs."

But the path ahead for EVs will not always be smooth, the forecast continues:

- "Charging infrastructure is still not solved.
- "The impact of autonomous driving is limited for the next 10 years, but ride hailing and car sharing services will have an impact sooner.

What of unintended consequences?

While the disruptions above are real, in some ways the analysis is a little shortsighted, for reasons that will become apparent presently.

An opinion piece by Tony Seba and James Arbib in the *San Francisco Chronicle* for July 10 talks about the disruption a century ago in which the streets in New York that had been crowded with horses and carriages, with very few automobiles to be found, by 1913 were crowded with automobiles, with very

few horses and carriages to be found.

The piece then cites "Rethinking Transportation," the first report from independent think tank RethinkX, [which] finds that within 10 years of widespread regulatory approval of driverless vehicles — which we anticipate in 2021 — 95 percent of U.S. passenger miles traveled will be served by on-demand, autonomous electric vehicles owned by companies providing transport as a service. That transportation will be four to 10 times cheaper per mile than operating a new or existing vehicle."

The authors predict a profound reshaping of the economy, with effects dependent on decisions to be made in the immediate future.

"Cost per mile will become the key metric in transportation. The biggest saving comes from the extended life of an electric vehicle, which can easily travel more than 500,000 miles, and will cost 70 percent less to fuel and 80 percent less to maintain.

"Savings of a minimum of \$5,600 per year per average American household will add \$1 trillion to the annual disposable income of U.S. households, the single largest economic boost in U.S. history. We foresee another \$1 trillion in productivity gains as people work, study or shop instead of wasting time behind the wheel. There will be 80 percent fewer passenger vehicles on U.S. roads by 2030, freeing up enormous space in cities.

"Unprecedented levels of mobility will be enjoyed by the disabled, the elderly, the young and low-income people.

"But just as new fortunes will be made, others will be lost:

"Car dealers, garages and auto insurance companies will suffer.

"Driving jobs will disappear.

"Automakers will have to morph into low-margin, high-volume assemblers of autonomous electric vehicles, or get into the business of selling the transportation service directly.

"Oil demand will collapse and high-cost oilfields and infrastructure projects won't survive."

On the whole, Seba and Arbib seem to believe that the overall result will be good. They suggest that, for example, that with no more need for parking lots of space will be opened up for more beneficial things. The

loss of income from gas taxes, of course, will have to be made up, but little is said — beyond a few bland generalities — about the inevitable disruption to employment, other than to warn that policy makers must guard against pushback by those displaced.

A much more current phenomenon is occurring now in San Francisco. The city a while back decided to do all it could to discourage cars and emphasize transit. The result? As private cars have decreased in number they have been replaced by Uber and Lyft vehicles cruising for fares, resulting in worse traffic tie-ups than before. Cabs were closely regulated; drivers were licensed and insured, and the number of taxis was limited, both to prevent congestion and to help ensure that taxi drives could actually make a living.

Now the cabbies are unemployed and the streets are jammed with untrained and unregulated amateurs, who have to work insane hours to make less than taxis drivers did working more reasonable hours.

This is progress?

One thing that may change for the better (for the benefit of the people using the service, not for those providing it): It has long been true that city taxis (in New York, Philadelphia, Washington or wherever) are water-soluble. As soon as it begins to rain they vanish. One wonders if there may be so many Uber and Lyft vehicles out there that they will be available even in the rain.

THE UTILITIES STRIKE BACK

A few days ago Jay Beckerman sent out a link to a story (“Rooftop Solar Dims Under Pressure From Utility Lobbyists,” by Hiroko Tabuchi, *New York Times*, July 8, 2017) that describes lobbying efforts by electric utilities across the nation to slow or stop the spread of rooftop solar — an effort that seems to be succeeding in many places.

The utilities’ biggest complaint is not the use of solar energy in place of fossil fuel, but the spread of net metering, which requires the electric company to pay full retail for excess energy that customers with solar panels feed back into the grid.

And the utilities do have a point. As stated in a policy statement by the Edison Electric Institute, “Through the credit they receive, net-metered customers effectively are avoid-

ing paying these costs for the grid. As a result, these costs are shifted to those customers without rooftop solar or other DG systems through higher utility bills.”

The *Times* article counters that in many places these costs to the utility are quite small, yet they are reacting to what they perceive as an oncoming problem. And for the homeowner with solar panels on his roof, staying connected to the grid does entail responsibility to help pay to maintain it. The only alternative would be to go completely off the grid.

Is going off-grid the answer?

Certainly going completely off the grid by using both solar panels and batteries hurts the power company. But what about the homeowner who does it?

Said a January 30 article in *UT New*, from the University of Texas at Austin, “storing solar energy today offers fewer environmental benefits than just sending it straight to the grid, because the energy lost to storage inefficiencies [in charging and discharging the battery] is ultimately made up with fossil-fuel electricity from the grid.”

But that’s not the whole story, says the article, quoting Michael Webber, a professor in the Department of Mechanical Engineering and deputy director of UT Austin’s Energy Institute: “If we use the storage as the means to foster the adoption of significantly more renewables that offset the dirtiest sources, then storage — done the right way and installed at large-scale — can have beneficial impacts on the grid’s emissions overall,” Webber said.”

What’s a power company to do?

A September 4, 2014 blog by Laura Wisland, senior analyst, Clean Energy at the Union of Concerned Scientists, helpfully suggested that “[u]tilities need to find new ways to find revenues to operate poles and wires that make our electricity grid work, while encouraging more of their customers to go solar and provide their own clean electricity.” Unfortunately, no suggestions on how to do that are included.

While the electric utilities may be trying (and in many cases succeeding) to get state legislatures to cut back or eliminate solar power subsidies, at least they’re not trying to

eliminate all alternate energy. Remember the following passage from last month's Newsletter:

"...Wyoming, where there are a lot of open-pit coal mines as well as a lot of wind-swept prairie, tried in 2010 to help out the coal mines by levying a special tax on wind energy, and recently proposed to increase that tax from \$1 per MWh to \$5 per MWh. That was defeated by the state legislature in January, but another bill, which would essentially forbid utilities in the state to use renewable energy, was introduced a bit later. That one died in committee at the end of February.

"So perhaps there's some hope for them."
Let's hope so.

NEWS UPDATE

Faraday kills plans for Nevada plant

A July 10 article by the AP's Alison Noon reports that Faraday Future has scrapped plans for a \$1 billion manufacturing plant in Nevada. Work on the project was halted but not, apparently, in November, but now the company has said it plans to purchase an existing facility. "The announcement came days after reports that a Shanghai court froze more than \$180 million in assets belonging to one of the company's biggest backers, tech billionaire Jia Yueting," the article continues. "The company said that Jia's financial problems were not related to the decision."

Fisker shows his latest idea



Henrik Fisker, whose original EV company went nowhere, launched a new pair of ventures called Fisker and Fisker Nanotech in the fall of 2016, according to a June 7 article by Tony Markovich in *Car & Driver*. Now, says the article, he has rolled out his EMotion EV,

which claims 400 miles of range, supercapacitors and grapheme battery technology, a top speed of 161 mph and a price of \$130,000. Cars are to be marked as 2019 models. Given Mr. Fisker's record, we will reserve judgement.

All EVs or hybrids for Volvo

On July 5 Volvo Cars announced that every Volvo it launches from 2019 will have an electric motor, marking the end of cars that have only an internal combustion engine and placing electrification at the core of its future business. The company plans a portfolio of electrified cars across its model range: five fully electric cars between 2019 and 2021, three of which will be Volvo models and two of which will be high performance electrified cars from Polestar, Volvo Cars' performance car arm. These five cars will be supplemented by a range of gasoline and diesel plug in hybrid and mild hybrid 48 volt options on all models.

There has been some speculation that the decision was influenced by Volvo's present owner, the Chinese company Geely.

France to phase out ICE cars

A July 6 story by Teresa Welsh of McClatchy New Service reports that "France will no longer sell gas and diesel vehicles after 2040 to help the country meet its goals under the Paris climate agreement." The government is also offering subsidies to owners of older gasoline and diesel cars for the purchase of newer and cleaner models. "The ecology minister also announced France will ban any new project using petrol, gas, coal and shale oil by 2040. [Ecology minister Nicolas] Hulot said the country hopes to be carbon neutral by 2050."

"Norway aims to end sales of gas and diesel vehicles by 2025. India wants all cars to be electric by 2030. Germany is attempting to have one million electric cars on its roads by 2020."

Renewable Energy Surges Past Nuclear For First Time In Decades

By Michael Biesecker, The Associated Press, July 6.

"WASHINGTON (AP) — For the first time in decades, the United States got more

electricity from renewable sources than nuclear power in March and April.

“The U.S. Energy Information Administration said Thursday that electricity production from utility-scale renewable sources exceeded nuclear generation in the most recent months for which data is available. That's the first time renewable sources have outpaced nuclear since 1984.

“The growth in renewables was fueled by scores of new wind turbines and solar farms, as well as recent increases in hydroelectric power as a result of heavy snow and rain in Western states last winter. More than 60 percent of all utility-scale electricity generating capacity that came online last year was from wind and solar.

“In contrast, the pace of construction of new nuclear reactors has slowed in recent decades amid soaring costs and growing public opposition. Nearly all nuclear plants now in use began operation between 1970 and 1990, with utilities starting to retire some of their older reactors.

“Still, experts predict output from the nation's nuclear plants will still outpace renewables for the full year, due to such seasonal variation as less water flowing through dams in the drier summer months. Also, nuclear plants tend to undergo maintenance during spring and fall months, when overall electricity demand is lower than in summer or winter.

“Despite the growth in renewables, the U.S. still gets nearly two-thirds of its electricity from burning fossil fuels, primarily natural gas and coal. Nuclear and renewables account for roughly equal shares of the rest, each accounting for less than 20 percent of total output.”

Big Tesla battery for South Australia

On July 6 Tesla announced that it would be building and installing a 100 MW/129 MWh Powerpack system to be paired with global renewable energy provider Neoen's Hornsdale Wind Farm near Jamestown, South Australia. This should help alleviate the chronic power shortage and frequent outages, some of which have affected more than 1 million people. Upon completion by December 2017, this system will be the largest lithium-ion battery storage project in the world and will

provide enough power for more than 30,000 homes, approximately equal to the number of homes that lost power during the blackout that followed a 50-year storm last September.

Last big coal plant in New England closes

A May 31 AP story reports that the Brayton Point Power Station, New England's largest remaining coal-fired power plant, was shutting down. The plant, which had been cited as a major polluter, had been made uneconomical by the decreasing cost of natural gas.

Southern pulls plug on clean coal plant

On June 28 Southern Company and its subsidiary Mississippi Power announced that it was suspending start-up and operations activities involving the lignite gasification portion of the Kemper County energy facility. The facility will continue to operate using natural gas pending the Mississippi Public Service Commission's decision on future operations.

The company's original plan was to gasify coal, burn the resulting gas for power, then capture the resulting carbon dioxide and pump it underground. A combination of technical hurdles, cost overruns, changing economics and finally a ruling by the Public Service Commission led to pulling the plug.

But moves ahead on batteries

ATLANTA, July 12, 2017 /PRNewswire/ — Building on its 100-year commitment to innovation and historic focus on the research and development of emerging energy solutions, Southern Company and its Gulf Power subsidiary today officially launched the latest battery storage research project in Southern Company's operating territory.

Located in Pensacola, Florida, at Gulf Power's Douglas L. McCrary Training and Storm Center, the new research project will test and evaluate a 250 kW/1 MWhr Tesla Powerpack lithium-ion industrial energy storage system over a two-year period. Insights gained from the demonstration are expected to accelerate the development of battery storage technology across the Southern Company system.

Perhaps they should check with South Australia.

[Full disclosure: Your editor maintains a position in Southern]

Electric bus maker Proterra raises \$55m

By David Baker, *San Francisco Chronicle*, June 13: “Proterra, the Burlingame builder of electric buses, announced Tuesday that it has raised \$55 million in its series 6 funding round, with new investors including BMW’s venture capital arm and a firm chaired by former Vice President Al Gore.

“The new cash infusion follows an over-subscribed \$140 million series 5 round in January. Proterra will use the money from Gore’s Generation Investment Management and BMW i Ventures to ramp up production at its two factories — one in South Carolina, the other in the City of Industry in Los Angeles County.

“The company, which is also developing self-driving buses, has raised roughly \$345 million to date.”

REAL ESTATE INSANITY By California Pete



The cost of housing in California continues its rise to the stratosphere, according to a June 19 article by Angela Hart in the *Sacramento Bee*. “Projections show rents will continue to surge, especially for low- and middle-income people in places like San Francisco, Los Angeles and Sacramento, and home prices will become increasingly expensive, according to an economic analysis in the Anderson Forecast from the University of California, Los Angeles, released this month,” says the article.

There have been sporadic efforts to allocate more state money for affordable housing, along with adjustments to regulations, but these inevitably run into a solid wall of opposition from environmentalists, unions and NIMBYs, who use zoning laws, environmental impact reviews and local regulations to keep out the less affluent. The folks in toney Marin County, across the Golden Gate Bridge from San Francisco, resist anything that might threaten their home values — “[t]he median

price of a single-family home in Marin hit \$1,127,500 in March, approaching the record high of \$1.2 million set last summer,” according to the Bay Area News Group. And, of course, it’s vital to keep lesser mortals away. San Francisco isn’t any better, with the “median sold price for single family homes rising to its highest level on record, \$1,407,000, in April, according to *TheFrontSteps* real estate blog. And the median rent for a single room (not a one-bedroom apartment, but just a single room) is \$1350.

An odd conflict has arisen, as discussed in “San Francisco’s Civil War,” by Henry Grabar in *Slate* for June 28. Grabar divides the left (in San Francisco that’s a bit further to the left than in most places) into two camps, both of which insist that their goal is to increase the availability of affordable housing. One group, the YIMBYs (Yes in My Backyard) believe the solution is to (surprise!) build more housing. The other, the Democratic Socialist Alliance (DSA), bears a deep hatred for the YIMBYs, insisting that allowing developers to address the housing shortage by (oh, no!) building more housing would *increase* rents, apparently because they would cause gentrification. They’re not, says Grabar, quite sure of what the answer would be. Perhaps they should study the land reform and collectivization campaigns in China from 1947 to 1952, in which peasants newly energized by Mao and party attacked and killed anyone perceived as being a landlord, or as having a nicer house than his neighbors. Somewhere between 1 and 4.5 million people were killed.

That’s SF for you: 49 square miles surrounded by reality

Chinese EV companies keep moving here.

A June 3 article by David Baker in the *San Francisco Chronicle* reports that “Sokan Industry Group has opened its U.S. headquarters in Santa Clara, the company reported.... It has also established a research center in Ann Arbor, Mich.” The article adds that a good many of the Chinese EV makers are here primarily so they can impress investors that they are not just satisfying domestic Chinese EV mandates, but are expanding internationally. None, however, has yet to produce a car for sale here.

You think it's hot where you are?

The East Coast has been sweltering through days and weeks of hot and muggy weather, but it's far from the hottest place in the country; that honor generally goes to Death Valley, where summer temperatures of 120 ° are the norm, and where the current heat wave has led to even greater heat. So nobody would go there, right?

Not so, says an AP News article by Sally Ho and Christopher Weber: "Business booms as temperatures soar in July and August at Panamint Springs Resort, near the entrance of Death Valley National Park." That's right, bunches of international travellers, primarily from Europe, flock to Death Valley during the hottest part of the year. Chacun à son goût, I guess.

Incidentally, the high in Death Valley today is only 119, with a low of 91. Saturday should see 122.

The fire this time

The rainy winter has had the usual effect: lots more grass and underbrush, which is now drying out and catching fire. The folks around Lake Oroville in the Sierra foothills, who were evacuated because of the threat of dam failure (see the March issue, page 7) are now facing evacuation in the face of spreading wildfires. This is just the beginning of fire season (higher elevations are still damp), so we'll definitely see more and bigger.

Meanwhile there has been an interesting series of fires in the East Bay. Rapidly-gentrifying Oakland and its near neighbor Emeryville have seen a string of arson fires of apartment buildings under construction since October of last year. No suspects so far.

Organic pot only

For many years the marijuana market in California was illegal, and many people — especially, one suspects, the old hippies up in the Emerald Triangle of Mendocino, Humboldt and Trinity Counties — liked it that way. Of course there was some encroachment by Mexican drug gangs, with armed guards, but mostly things were pretty mellow. But then "medicinal" pot was legalized, and as soon as something is legal someone wants to regulate it. Now, according to a July 4 article by Peter Fimrite of the *San Francisco*

Chronicle: "The California Bureau of Marijuana Control issued a draft plan this spring that set some of the stiffest limits in the country for solvents, pesticides and microbial contaminants such as fungus and bacteria in the sticky bud, pills and edibles sold at medical cannabis dispensaries." That means growers can't spray whatever they like to keep the bug off their pot, and in fact the contamination limits on pot appear stricter than those on food. "The proposal sets parts-per-million limits for 88 different solvents, chemicals and pesticides, including myclobutanil, a widely used fungicide, and the insecticides carbaryl and malathion, which are commonly used to control bugs that attack fruits, vegetables and marijuana plants."

This will add significantly to the cost of pot, so people aren't all that happy. Maybe if they just smoked more they wouldn't get so upset.

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

Unless otherwise stated, 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.

August 9

Cugini's Pizza, Locust Grove Plaza, 1692 Clements Bridge Rd, Deptford NJ (Across from the Deptford Mall)

September 13

At Mt. Holly Motorsports during the NDEW event.

October 11

November 8