EEVC NEWSLETTER

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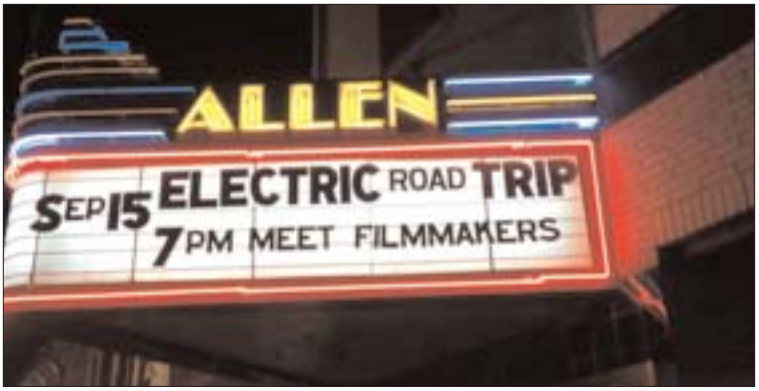
Affiliated with EAA

EEVC PARTICIPATES IN NATIONAL DRIVE ELECTRIC WEEK

Oliver Perry

Plug in America and the EAA encouraged EV enthusiasts to participate in EV promotional events during what was proclaimed to be National Drive Electric Week, September 15-21. EEVC member Brandon Hollinger announced to our membership that he was promoting several events during the week and asked for as many of us who could to participate in one or both events. The first event (which I was able to attend) was the viewing of a documentary film called *Electric Road Trip* scheduled for Monday, September 15th. Brandon organized the event for the Allen Theater, a small refurbished theater in the town of Annville, Pennsylvania.

EEVC member Brandon Hollinger: organizer and promoter of the Allen Theater showing of the Maryland PBS video: The Electric Road Trip.



"The Allen Theatre is a beautiful, old independent theatre with full restaurant and coffee house attached — all done in a sweet Art Deco style. The owner Skip Hicks does a wonderful job keeping the movie schedule filled great, thought-provoking independent films."

Organizing such an event is not new for Brandon. In his words, "The owner of the theatre contacted

Brandon Hollinger's converted electric Saab was one of the vehicles lined up outside the Allen Theater. Brandon is making classic car conversions. Check out his web site pictured on the decal on the side of his car.

Film maker Jonathan Slade (on the right) discusses electric car usage with an attendee at the showing of the movie The Electric Road trip. About 10 EVs were lined up outside the theater before the time for the showing of the movie The Electric Road Trip.

me to help promote The Electric Road Trip since we did so well when we screened *Revenge of the Electric Car* a few years ago.

Back in 2011, I approached him (Skip Hicks) with the hope of having an early screening of *Revenge of the Electric Car*. I had just been invited to be on the ROTEC web site, so we were able to get a hold of it before many major cities, and were 11th in the nation to view it. I promoted an entire event around it with several sweet, rare electric cars on display, brought an EV motor to see up close, introduced the film and hosted a pretty interesting Q&A afterwards. It was pretty awesome."

At 6:00 P.M., before the 7:00 P.M. showing of Monday's September 15th film, *Electric Road Trip*, a number of electric cars from the area were lined up on both sides of the street out in front of the theater. Included in the street display was Don Auker's Tesla Sedan, Brandon Hollinger's converted Saab, and Al Arrison's converted S-10 pickup truck. A Leaf and several other electrics rounded out the display. Ken Barbour was able to place his electric Zero motorcycle in the foyer of the theater for prime time display.

All proceeds of the film were used to help finance the installation of a charging station for the Allen Theater.

History and Review of the Film

Intro to film…

Back in 2012 Filmmaker Jonathan Slade and his wife Novia Campbell set out from Oakland, Maryland in their electric car with one question in mind: how long will it take them to make it to Ocean City, Maryland — more than 500 miles — using only electric charging stations along the way? What unfolds is a 21st century adventure and a lesson for anyone interested in the development of alternative energy.

With support from Maryland Public Television the documentary was eventually shown on seven Public Television channels. It is currently listed as one of MPT's available special downloads.

Story line of film…

Slade and Campbell departed from Oakland, Maryland around noon on Monday, July 23, 2012, and arrived at the southern tip of the Ocean City Boardwalk at noon on Saturday July 28, 2012, racking up 520.1 miles, and plugging into only Level 1 (110 Volt) and Level 2 (240 Volt) chargers along the way.

Slade and Campbell documented their journey on digital video as they charged at both public and private charging stations, met other EV early adopters, chatted with historians about great feats of transportation engineering, and ultimately evaluated the current EV infrastructure across the state.

Eating in roadside diners, and checking out other local attractions while they charged their car (yarn stores, a vineyard, a souvenir shop, a cheesemaker), *The Electirc Road Trip: From Oakland to Ocean City* will hopefully jump-start the conversation about trans-

portation infrastructure for the 21st century.

Results

Between 50 and 70 people attended the showing. Questions and answers were provided after the showing by the filmmaker. Unfortunately the event was more like a "preaching to the choir" than informing thirsty low information viewers.

For those of us attuned to taking road trips in an electric car there was little to be learned from the film. However, it was encouraging to see that MPT was involved in producing and promoting such a film. Since the film was made to appeal to public television viewers we saw countryside, food, and interesting people in addition to charging stations, which made the presentation entertaining for everyone. The event was worth attending even for seasoned EV adventurers.

Trip from New Jersey to Annville

Three of us from New Jersey had the day off and were able to travel out to Annville for the 7:00 P.M. event. I drove my van in order to pick up some old used electronic equipment from Peg Groening. We met briefly in Langhorne Pa at 11:30 A.M. before I continued on the Pennsylvania Turnpike to meet up with Ken Barbour and Al Arrison. Peg conveniently happened to be visiting a friend in Langhorne, which was just off my route. We arranged our meeting in order for Peg to hand off to me her late husband Ron's car trunk full of electrical and ham radio supplies. Ron had accumulated a lot of technical equipment in their garage and basement over the years. Peg's wishes were for EEVC members to have first refusal.

After the goodbye to Peg I was "texted in" by Ken Barbour to a charging station (in Eagleview Plaza) just off the Turnpike on route 100. There I met up with Al Arrison and Ken. Al was topping off the battery pack on his Chevy S-10 pickup. Ken's motorcycle was resting in the bed of Al's truck fully charged. Ken and Al had been there an hour or so having lunch while Al charged.

I followed the duo as they drove from that Turnpike exit up to Don Auker's home near Lebanon, PA. After putting the truck on charge we drove my van over to Denny Stichter's house, less than a mile away to check in on Denny. He was at work on several projects, but particularly anxious for us to take a look at the DC electric motor in his Ford Ranger pickup.

Unfortunately, a few weeks previous, the shifting lever had popped out of gear while the truck was being driven, allowing the motor to race beyond its maximum rpm. While the transmission was in neutral there was no mechanical load on the motor. Electric motors have a max speed. When exceeded the internal armature and related parts can literally blow apart.

An inspection of the motor hopefully revealed minor problems. Denny will have to take the motor totally apart to find out exactly what was damaged. We were able to rotate the commutator by hand to a point where we encountered some serious friction. Visual inspection through the brush area housing showed no blown windings.

A few minutes before 6:00 P.M. Don Auker led us over to the Allen Theater in Annville with his Tesla Sedan. Ken drove his motorcycle and Al his truck. After the movie we returned to Don's home and Al topped off his truck for the return trip. I followed Ken and Al back toward NJ on the Turnpike. We stopped off at one of the rest areas on the PA turnpike where there is a charging station. Ken said it was the only one on the eastern end of the PA turnpike. We hung around in the inside eating area until about 1:00 A.M. when Al was able to finish off his charging.

Ken, having to go to work the same day, 9:00 A.M only a few hours away, expressed the frustration of having to sit so long waiting for a charge. Quick charging is necessary if masses of people are going to drive electrics on drives beyond their battery capability.

We said our goodbyes. Ken and Al took 322 down to the Commodore Berry Bridge. I went through Philly and crossed over the Ben Franklin. I got home at 3:00 A.M. Hanging out with the electric truck I participated in a lengthy trip requiring a few charging stations along the way. For now, waiting for a full charge is part of the experience when you want to travel further than the battery will allow.

Our Science and Math Students Do Not Seem To Be Improving With Added Funds

Oliver Perry

September is "back to school" month for everybody in the U.S., although some started in late August.

Ms. Marina Ratner, a professor emerita of mathematics at the University of California at Berkeley, awarded the international Ostrowski Prize in 1993, and the John J. Carty Award from the National Academy of Sciences, of which she is a member, recently wrote an editorial for the *Wall Street Journal* entitled, "Making Math Education Even Worse." Ratner attacks the new Common Core Standards that are being instituted in schools throughout our land. According to her, adapting them at the cost of about 16 BILLION dollars will set the U.S. further behind the nations who already lead us in math and science education test scores.

Is there anyone anywhere who feels that we as a nation are improving our science and math education? As my wife pointed out to me the other night, the great science video provider on PBS, Nova, seemingly has been dumbing down its productions recently in an attempt to keep viewers tuning in. Who in this country wants to watch math and science shows, especially if they are technically oriented? We want adventure, excitement, and thrills, not science and math lessons. Blow the damned thing up and send body parts flying in all directions if you want to attract viewers.

In our organization (EEVC) we would like to continue to discuss the pros and cons of electric cars. But how many people are interested in learning anything technical about EVs? How many people off the street are technically literate?

From the day I entered the profession of science teaching I was appalled at the U.S. system for the tendency to pass students who learned how to pass tests but did not really understand the fundamentals of math and science principles. There are many other like-minded teaching professionals in education who are appalled at this dumbing down of America. Apparently we as a nation are not making a lot of progress toward improvement in science and math education for the masses. (We might be improving it for a select few in every high school and in the private and charter schools.) Our leaders are not demanding improvement in science and math by holding back students (and their parents) who don't want to meet requirements. Rather than spend billions in researching core curriculum standards we ought to spend the money in building bigger schools and hiring additional staff to teach those not being promoted. In short time the lesson would be learned that being held back is real for those who don't shape up and things would return to normal.

Ask high school and college students who have taken chemistry what a mole is. That question is equivalent to asking a grocer what a "dozen" is. Proceed to ask the student to give you a mole of water and hand them a graduated cylinder. That question is equivalent to asking 10 ounces of M&Ms when you hand them a tablespoon and an M&M weight to volume chart.

When it comes to science and math I would like every high school graduate in our country to be able to solve the following problem without anybody's help other than a reference book that provided energy equivalent charts.

How long in minutes would the sun have to shine from directly overhead... (rays perpendicular to the solar cell surface) on a one foot square solar panel that converted sunlight into electrical energy at 12% efficiency, to provide the amount of heat energy in one gallon of gasoline? (without a calculator)

Whiz... whiz... whiz.. test.. test.. and move on to more memorization and rote patterns of learning. Don't keep the student in F land until he or she can really understand how to do the above questions. Pass on and let them miss the concept questions on the test, earning an A- or less. In most classes the students can miss the questions that evaluate true understanding of the concepts and still earn good grades. I was told over and over again in my career to put enough easy questions on my tests that all but the few really slow students could pass with a C or better. As long as the students knew that the mole has something to do with chemistry and a solar panel can produce electricity that was good enough.

How many of our U.S. graduates could solve the above problems even with a calcu-

lator with built in energy and unit conversions? How many years of math and how many courses in science have they had in 12 years of school? Do you see the disconnect?

Knowing the difference between a hybrid and a pure electric car is asking a lot of our students. But if they have purchased the "app" from Ken Barbour on their Apple phone they still might surprise us and come up with an answer. One thing they have learned to do better than us is to use apps and text on their i-phones.

Germany's Expensive Energy Gamble

The Wall Street Journal, Wed August 27, 2014, front page

The cost of producing a product is one thing, the cost of getting it into the hands of the consumer can be quite another.

Many of us have become enthusiastic over advances in alternative energy technology which now make it possible to produce large quantities of energy that economically compete with fossil fuels. One of the more exciting ways to accomplish this has been through advanced windmill technology. More and more we can observe large scale windmills cranking out electricity as we drive our interstate highways through mountain range regions here in Pennsylvania and New York states, as well as in a number of New England states. Are we arriving?

One might think so, but what is the cost of getting the wind produced energy to the consumer where it is needed?

According to a recent front page article in the *WSJ*, a world leader in wind energy, Germany, is taking a gamble that the time has come to take the steps needed to wean their country off from both nuclear and fossil fuel energy through wind from the North Sea. A project to carry high-voltage electricity over hundreds of miles of aluminum and steel cables stretching from the North Sea to Germany's industrial corridor in the south is the linchpin of a mammoth trillion euro plan to succeed the transition by mid century.

But many companies, economists, and German neighbors worry that the enormous cost to replace a currently working system will undermine the country's industrial base and weigh on the entire European economy. Average electricity costs for companies have jumped 60% over the past five years because of the costs passed along as part of government subsidies of renewable energy producers. Prices are now more than double those in the U.S. "German industry is going to gradually lose its competitiveness if this course isn't reversed soon," said Kurt Bock, chief executive of BASF SE, the world's largest chemical maker.

Germany's "lonely revolution" (to set the standard for alternative energy) goes further than the European Union's set of binding renewable energy targets for all its members. Germany expects to produce 40%-45% of its electricity from renewable sources by 2025, and 80% by 2050.

"Germany's current path of increasing high-cost energy will make the country less competitive in the world economy, penalize Germany in terms of jobs and industrial investment, and impose a significant cost on the overall economy and household income." warned Daniel Yergin, vice chairman of research firm IHS.

The German government says that once the renewable infrastructure is complete electricity prices should fall. However, rewiring the world's fourth largest economy has not been easy. This undertaking, the biggest infrastructure project since World War II, has been plagued with cost overruns, regulatory disputes, and questions of conservation. One issue: how to keep bats and birds from flying into the rotors of THOUSANDS of wind turbines going up across the country.

To encourage the expansion of green power production, the government guaranteed prices for electricity fed into the grid from renewable sources, such as wind turbines and solar panels, for twenty years. This subsidy is passed on to customers in surcharges. Even though the flood of new energy sources has increased the price for electricity, electrical energy prices have not gone down but up. On the spot market a kilowatt-hour of electricity costs 3.2 cents, half of what it did in 2011. The average spot price guaranteed by the government to the producer is 17 cents per kilowatt-hour. The difference is passed to the consumer, about 18% of the customer's electric bill.

To stem the tide of rising subsidy costs the German government has placed a cap on the

number of new green alternatives eligible for the government subsidy.

Over-all it has been the cost of DISTRIBUTING the new green electrical energy rather than the cost of producing it that has complicated matters. The government wants to modernize and build more than 4000 miles of high-voltage power lines both offshore and through densely populated areas. Gunther Oettinger, Europe's top energy official, compares Germany's strategy to building a train station before the tracks have been laid. Germany has been building wind park after wind park instead of focusing on how to transmit the electricity to where it is needed. Wilster Marsh (southern edge of the North Sea) is the on ramp for the "Stromautobahn," which translates to electric highway. From Wilste, to the final destination, a 500 mile long north-south corridor needs to be built. Although most support the concept, few locals want to see 230 foot-tall transmission line towers in their neighborhoods.

There, as always, seems to be, no free lunch. Some car parts are cheap and affordable, but cost prohibitive when it comes to shipping charges. In considering energy alternatives we must consider the cost of getting the energy to where it is needed.

In the Tour de Sol competition back in 1999, the fuel cell car team was stunned when they were charged fossil fuel points for the use of hydrogen, supposedly a non-fossil fuel (depending upon how it was generated). An investigation showed that a diesel truck had brought the hydrogen to the competition site over a coarse of many miles. The team was charged for the use of the fossil fuel used to transport the hydrogen, and rightly so.

EVS FOR WINTER USE ONLY

Provided global warming doesn't eliminate all snow and ice from Eastern Pennsylvania, the thought turns to how to get around in the stuff. While today's front-wheel-drive cars (EV and ICE alike) are considerably better in the snow than those of a few decades ago, the dedicated EVer who wants to go off-road in electric style has faced a shortage of ways to do it — until now. In 2010 a Finnish company names Arctic Power (www.acrticpower.fi) joined a research group called eSled (www.esled.fi) with the aim of developing an eco-friendly and silent solution for snowmobile safaris in Lapland, an ecologically sensitive area that gets a lot of tourists. Experiments were done using both lithium batteries and both methanol and hydrogen fuel cells, and by 2012 the company was manufacturing a small fleet of machines for the next snowmobile season. The project apparently wound up this year, and we haven't been able to find any mention of a product lone from the company.

But not to worry: others have had the same ideas. In SwedenEco Innovation AB and AB Elmacchina have both been working on the idea, and in the U.S. Clarkson University won over the University of Wisconsin-Madison and several others in the SAE-sponsored 2011 Clean Snowmobile Challenge. The 2015 event will be held this coming March, and we'll try to bring you some results when they become available.

In February of this year Autoblog reported on the MTT-136, "invented by Québécois inventor Yvon Martel," according to the article, which is essentially an electric tractor, with a rubber tread that goes over the top of the machine (which sticks out quite a ways in front the other handlebars) and wraps around the bottom, rather like one tread of a World War I tank. A video is available at www.youtube.com/watch?v=gcIwrdeP21s.

But so far there doesn't seem to be commercial electric snowmobile on the market. Maybe in a few years?

DISRUPTION FILM

Oliver P{erry reports that he was able to download the film *Disruption: Climate Change*, and show it at the September meeting. The film was released in advance of The People's Climate March, which attracted about 311,000 participants to the event held September 21, 2014, in New York City. For those who which it see the film, it's available at http://watchdisruption.com.

WHICH WAY OIL PRICES?

A few months ago there were reports that the price of oil would inevitably increase, as reported in an August 27 Reuters story by

Balazs Koranyi and Joachim Dagenborg. "Last year only half as much crude was discovered as consumed, according to consultancy Wood Mackenzie," says the article. "Big exploration campaigns in frontier places like West Africa and the Arctic Barents Sea have yielded little." Prices would inevitably rise as companies stopped exploring and the cost of finding new oil continued to climb. The article concludes with a quote from an oil executive: "'If we just continue to make this more and more expensive, then (Tesla CEO Elon) Musk with his batteries and solar panels will become cheaper than us and we'll be out of business,' said Hege Kverneland, the Chief Technology Office of National Oilwell Varco."

But the price of oil has not gone up; in fact it has gone down in recent months. Here's a look at the annual price of oil for the last ten years, adjusted for inflation (source: Inflationdata.com):

Year	Price
2003	$35.22
2004	$46.60
2005	$59.88
2006	$67.63
2007	$72.30
2008	$99.06
2009	$58.20
2010	$76.38
2011	$90.52
2012	$88.11
2013	$91.54

The spot price for West Texas Intermediate fell from $88.89 to $81.72 over the two weeks ending on October 14.

So what's going on?

A combination of factors is helping to keep crude prices down. Poor economies in Europe and other places, plus slower growth in China have cut demand; on the supply side, the U.S. is producing more than it has in decades. Saudi Arabia, the 800-lb gorilla of OPEC, would normally be expected to cut production to keep prices up (the Saudis have said repeatedly that they're comfortable with oil at about $100), but they're pumping as much as ever. Much of this is political: Low oil prices hurt arch-enemy Iran (Iran is Shiite while Saudi Arabia is Sunni, and they are competing for influence). Similarly it hurts Russia, which supports the Alawite (a Shia sect) Al-Assad government of Syria. A persistent drop in crude prices (abetted by Western sanctions) have the potential to run the Russian economy into the ditch and put a crimp in Putin's plans for territorial expansion, which is certainly a worthy goal.

But there's another possibility, related to the quote about Elon Musk: Historically, a period of rising oil prices has been followed by an upsurge in development of alternate energy. The oil barons, led by OPEC, like to wait until large investments have been made and then cut the price of oil, bankrupting the alternate-energy investors. Consider that the inflation-adjusted price in 1978 was $53.65; by 1980 it had reached $106.36. By 1985 it had fallen to $58.54, and in three more years had fallen to $29.45, which put the kibosh on a lot of alternate-energy projects.

REMEMBRANCE OF EARTHQUAKES PAST
By California Pete

A few days ago was the 25th anniversary of the 1989 Loma Prieta earthquake, which showed how poorly prepared the Bay Area (and California in general) was; several important freeways were destroyed, a section of the Bay Bridge collapsed (and was only just replaced this year — let's not rush into things). The result has been profound. Not only are the authorities finally taking earthquake preparedness seriously, but the destruction in San Francisco greatly altered the look of the place for the better. The Embarcadero, the street that runs along the edge of the Bay, is now a broad boulevard lined with tourist attractions. Back then it was an ugly two-deck elevated roadway 70 feet high and 50 feet wide that effectively cut the city off from the Bay and left everything beneath it in perpetual shade. Three years after the quake it had been demolished and the northeast shore was open.

City hall was rebuilt better than before,

decades of neglect were fixed, and its dome was covered in gold. And many other improvements were made.

But will they be enough? SF is only now getting around to requiring owners of so-called soft story buildings (those with big openings for garage doors or show windows on the ground floor) to have them reinforced.

And in the mean time the earth continues to creep. Surface measurements show that the main faults in the region — the San Andreas, the Calaveras, the Hayward, the Rodgers Creek and the Green Valley — are moving a few millimeters a year, and storing up energy in rock formations deep beneath the surface. Eventually one or more of them will let go in a big way (the 6.0 a few months ago in Napa was just a teaser). We'll eventually get a 6.8, 7.0 or maybe more.

What does it (and other disasters, like the Ebola epidemic and other nasties) all mean?

Perhaps it means that, as after the Loma Prieta quake, it's time for us, or the Earth, the clean house. Here's a relevant quote from several centuries ago:

Niccolò Machiavelli, *The Discourses*, Second Book: "And that these inundations, pestilences, and famines, occur, I do not believe there is any doubt, not only because all histories are full of them, but also because the effects of these oblivious things are seen, and because it appears reasonable they should be; For in nature as in simple bodies, when there is an accumulation of much superfluous matter, it very often moves by itself and makes a purgation which is healthy to that body; and so it happens in this compound body of the human race, that when all the provinces are full of inhabitants so that they cannot live or go elsewhere in order to occupy and fill up all places, and when human astuteness and malignity has gone as far as they can go, it happens of necessity that the world purges itself in one of the three ways, so that men having been chastised and reduced in number, live more commodiously and become better."

That's looking at the bright side.

COMING EVENTS

SAE 2014 Convergence

Oct 21-22, Detroit. For information go to www.sae.org/events/convergence

Challenge Bibendum China 2014

Nov 11 to 16, 2014, Chengdu, China. www.challengebibendum.com/eng/event/china-2014

2014 North American NGV Conference & Expo

November 11-14, Kansas City. www1.eere.energy.gov/cleancities/events_detail.html?event_id=8692

SAE 2014 Electric Powertrain Technologies Symposium

November 19, Stuttgart, Germany. www.sae.org/events/epts/

CALSTART Annual Meeting and Blue Sky Award Luncheon

Dec 9, Los Angeles. www.calstart.org/events/calstart-events/99-07-03/CALSTART_Annual_Meeting_and_Blue_Sky_Award_Luncheon.aspx?Events=EventItem

SAE 2015 Hybrid & Electric Vehicles Technologies Symposium

February 10-12, 2015, Los Angeles. www.sae.org/events/hybridev/

SAE Clean Snowmobile Challenge

March 2-7, Houghton, MI. http://students.sae.org/cds/snowmobile/event/

SAE 2015 World Congress & Exhibition

April 21-23, 2015, Detroit. www.sae.org/congress

2015 World Solar Challenge

October 6-13, Australia. Go to http://www.worldsolarchallenge.org

MEETING SCHEDULE

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.

November 12

December 10

January 14

February 11

March 11

April 8