

EEVC NEWSLETTER

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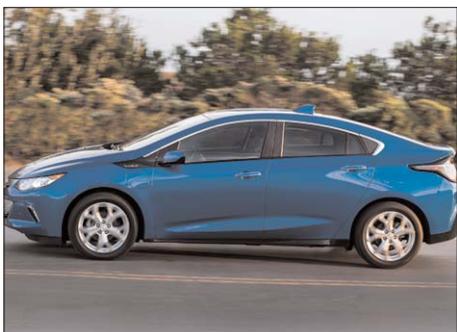
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TEST DRIVING TWO PHEVS Peter Cleaveland

My son is shopping for a plug-in hybrid to replace his 2011 Prius (a hybrid because he takes the occasional long trip, and doesn't want to



Your editor got a chance to test drive the 2016 Volt (l) and 2017 Ford Fusion Energi (r)

drop 40 grand on a Tesla). The goal, he says, is to stop using gasoline on his daily commute to work, which is almost exactly 20 miles each way. A few weeks ago he tried a 2016 Chevy Volt, and asked me to come along. More recently it was a Ford Fusion Energi. We both tried both cars, although in each case the "test drive," if you want to call it that, was just a few blocks.

A major hindrance for the tests was that the traction batteries on both cars were pretty nearly empty, so the gas engine was running almost the whole time.

Both cars had plenty of bells and whistles, but unless you like to spend more time playing with your car's electronics than driving it, that's sort of irrelevant to a test drive.

That said, here are my observations:

Volt

My son and I both found the Volt claustrophobic. When he drove I sat in the back, and I had a choice of putting my head down

to stare at the floor, or tipping it back into the recessed rear window; neither was satisfactory. When I got in the driver's seat I found it better, but still far from roomy. And when I ran the seat back far enough for my legs, there was no legroom behind me — although truth be told, that happens with full-size cars as well. Nobody sits behind me in my Impala.

As mentioned, the traction battery was nearly flat, so the only way you could tell that anything electric was happening was from the power-flow diagram on the video screen. The car did accelerate reasonably well when asked. The Volt is a series hybrid (all power to the drive wheels comes from the electric motor).

The Volt has a rated 53-mile electric-only range, so it would allow my son to commute sans-gas, and 106 mpg.

Fusion Energi

The Fusion had more interior room than the Volt, although I wouldn't call it spacious. The ride was comfortable, if a bit noisy.

Like the Volt, the Fusion we tried had no charge in its traction battery, and the entire test drive was done using the gasoline engine. The car has a 20 mile electric-only range, so if my son used it to commute he would have to charge at work.

The Fusion has a continuously-variable transmission, like the Prius, which makes it a parallel hybrid. I found the acceleration for anything but the most genteel driving inadequate, although if the battery had been full this might not have been the case. Pushing the pedal nearly to the floor produced somewhat better acceleration, but at the cost of the engine going into an angry thrash. This may simply be poorer soundproofing, but it wasn't confidence-building. I was able to take a turn at some speed (after warning the dealer rep I was going to do it), and the car handled it well.

PRESIDENT'S MESSAGE

O. H. Perry

From the book *Crippled America: How to Make America Great Again*

Author: Donald J. Trump

Selected Quotes From Chapter 6: The Energy Debate: A lot of Hot Air

The purpose of this article is to provide our readers with a glimpse of what President Elect Donald Trump's position was, regarding the climate change debate and acceptable sources of energy, before he was elected. Each statement has been pulled from chapter six. Although several complete paragraphs have been included, most of the chapter text has been excluded.

In Donald Trump's words:

"As often attributed to Mark Twain, 'Everybody talks about the weather, but nobody does anything about it.' Apparently we're trying to prove him wrong.

"We are actually blaming weather patterns on man-made causes. First, the so-called 'experts' told us we were responsible for global warming, but then, when temperatures

started dropping scientists began referring to these variations as 'climate change.'"

(Perhaps he meant the observation that some local temperatures are dropping while others might be rising. Ice is melting at the North Pole but is forming at the South Pole.)

"Now these experts can't figure out whether it is getting too hot or too cold, so the new term is "extreme weather conditions." That covers everything from boiling water to frigid ice. However, the point is the same: By sending the by-products of burning fossil fuels into the atmosphere, we have supposedly changed the natural weather patterns.

"In his 2015 State of the Union speech, President Obama declared the biggest threat on the planet today is climate change. The biggest threat? We have ISIS troops chopping off the heads of innocent Christian missionaries. We have a coalition of adversaries in Syria supporting a dictator who uses chemical weapons on his own people. We have millions of Americans who have mortgages greater than the value of their property, while middle-class incomes are stagnant and more than 40 million citizens are living at poverty levels.

"And our president is most concerned about climate change?

"If you go back in history, you'll find that the biggest tornadoes we've had in this country took place in the 1890s and the most hurricanes occurred in the 1860s and 70s. Violent climate changes are nothing new.

"We have even had ice ages.

"I just don't happen to believe they are man-made.

"I do agree that the so-called global climate change is causing us some problems. It is causing us to waste billions of dollars to develop technologies we don't need to fill our energy needs.

"The truth is, we have sufficient energy supplies in this country to power us into the next century — all we have to do is develop them. According to the Department of Energy, the natural gas reserves we have in the ground could supply our energy needs for centuries.

"There has been a big push to develop alternative forms of energy... so called green energy... from renewable sources. That's another big mistake. To begin with the whole push for renewable energy is being driven by the wrong motivation, mistaken belief that global change

is being caused by carbon emissions.

“The most popular source of green energy is solar panels. They work, but they do not make economic sense. They don’t provide enough energy savings to cover the cost of installing them. They are the most highly subsidized form of green energy in America. When it proves to be affordable and reliable in providing a substantial percent of our energy needs, then maybe it will be worth discussing.

“Like other countries Scotland is trying to completely fulfill its energy needs from renewable sources with the next decade, but there is considerable skepticism about that plan. Bill Gates said flatly in 2015, ‘Renewable energy can’t do the job. Governments should switch green subsidies into R&D.’ The cost to generate that much power from solar and wind energy would be, he (Gates) ‘beyond astronomical.’ He told the *Financial Times* that the answer to supplying our future energy needs is going to come from technological breakthroughs yet to be achieved. Gates said he intended to invest as much as \$2 billion in renewable energy research... but not in the development of wind and solar energy.

“The bottom line is that we are going to remain dependent on oil and natural gas to fill our energy needs for a long time into the future.... Until there is a better alternative or green way of supplying our energy needs, we must put our resources (oil and gas implied) to work for us...now.”

NEWS UPDATE

Chevy Bolt Named Motor Trend car of the year



Motor Trend magazine has selected a vehicle that isn’t yet on the market as its car of the year. In a November 14 article Angus

MacKenzie points out that, while GM has built other EVs in the past, including the Electrovair and the EV-1, and is currently selling an all-electric version of the Spark; “the Bolt EV is the first conceived from the get-go by GM to be a viable, affordable mass-market electric vehicle. And it’s a game changer.”

Two numbers are relevant here, says MacKenzie: 238 and 29,995. “The first is the number of miles the EPA has certified the Bolt EV will travel on a full charge. The second is the price, in dollars, of the Bolt EV, after allowing for a \$7,500 federal tax rebate. By offering that range at that price, the Bolt EV has made just about every other electric vehicle on sale obsolete. ‘Simply put, it’s twice the car for half the price of a BMW i3,’ guest judge Chris Theodore said. ‘A better car, better package, much better handling, with twice the range.’”

We’ll see if we can get a test drive when the car is available. The *Motor Trend* article is at www.motortrend.com/news/chevrolet-bolt-ev-2017-car-of-the-year.

Other *Motor Trend* notes

Motor Trend’s current issue also notes that Volkswagen’s 2017 e-Golf has “a new lithium-ion battery pack that increases capacity from 24.2 kilowatt-hours to 35.8 kWh. That increases the range 50 percent from the current 83 miles to 124.” And on the U.S. front, that the 2017 Cadillac CT6 Plug-In Hybrid will have 30 miles of all-electric range, a total range of 400 miles, and a price of \$76,090.

Jaguar announces an EV SUV



Jaguar, long the home of luxurious, high-

performance cars, is coming out with an SUV— and it's an EV. The Jaguar I-PACE, set for production in a couple of years.

This isn't Jaguar's first SUV; the F-PACE has been selling well, but, according to a November 15 Reuters article by Alexandria Page, the company faced a number of challenges. California law mandates that 15 percent of a manufacturer's cars sold in the state be zero-emission by 2025; at the same time cheap gas has caused customers to demand larger vehicles, like SUVs. The I-PACE is Jaguar's answer. It will also, says the article, likely beat BMW and Mercedes to the punch in this niche when it is available in 2018.

The I-PACE boasts a range of 220 miles from a 90-kWh battery and dual motors, with a zero-to-sixty time of "around 4 seconds," according to the company.

It looks like the car is aimed straight at the Tesla Model X, but it will, says Joe Eberhardt, CEO of Jaguar Land Rover North America, cost considerably less.

Not to be left out, Hyundai announced at the Los Angeles Auto Show that it would be producing an EV SUV, although it did not say when, just that it would have a 200 mile range.

Good news on the environmental front

A number of news items in recent days have given those worried about climate change some reasons for hope. The first is from the U.S. Energy Efficiency Administration: "U.S. energy-related carbon dioxide (CO₂) emissions totaled 2,530 million metric tons in the first six months of 2016. This was the lowest emissions level for the first six months of the year since 1991, as mild weather and changes in the fuels used to generate electricity contributed to the decline in energy-related emissions. EIA's Short-Term Energy Outlook projects that energy-associated CO₂ emissions will fall to 5,179 million metric tons in 2016, the lowest annual level since 1992."

The biggest change in consumption was in coal: "Coal consumption fell 18%, while natural gas consumption fell 1%. These declines more than offset a 1% increase in total petroleum consumption, which rose during that period as a result of low gasoline prices."

The second bit of good news comes from Lawrence Berkeley National Laboratory:

"Wind energy pricing is at an all-time low, according to a new report released by the U.S. Department of Energy and prepared by Lawrence Berkeley National Laboratory (Berkeley Lab). The prices offered by wind projects to utility purchasers averaged under 2.5¢/kWh for projects negotiating contracts in 2014, spurring demand for wind energy."

The third is from Elon Musk, who, according to an October 28 article by David Baker of the *San Francisco Chronicle*, recently showed off roof tiles with embedded photovoltaic cells — which is a bit odd, considering that solar roof tiles and shingles have been around for some years now, although without much commercial success. The tiles Musk showed are made by soon-to-be-merged-with-Tesla Solar City, and are designed to be used with the Tesla Power-Wall battery system. "Musk has noted," says the article, "that a new, electricity-generating roof would make financial sense for only people whose are either building a new house or need to replace an aging, worn-out roof. On Friday, however, he did not reveal the roof's price or expected electrical output."

Electric garbage trucks

Another David Baker article in the *Chronicle* for November 2 talks about a local (Alameda-based) startup called Wrightspeed, led by Ian Wright, a co-founder of Tesla. Wrightspeed makes serial hybrid replacement powertrains for commercial vehicles, and is fitting them into 16 trash trucks that serve nearby Sonoma and western Marin counties. They will, the company claims, cut diesel fuel consumption by about 60 percent, and should pay for themselves within two or three years.

All this is very interesting, but the trash trucks that serve my area, just a few miles away (just south of Oakland) are from Waste Management, and they use no diesel or other fossil fuel at all. They're powered by natural gas (using slightly modified diesel engines), and WM gets the gas from its own landfills. There is no diesel smoke or smell, and the fuel is almost free.

Moving nuclear ahead

While nuclear power — at least conventional nuclear power — seems to be moving

pretty slowly, several companies are continuing to push it. Georgia-based Southern Company (full disclosure: your editor owns stock in SO) is one of the only companies building new nuclear power plants, with construction on units 3 and 4 of its Vogtle plant moving ahead. There have been delays, as one would imagine, and the expected date for operation has been moved back from 2016 to 2019 and 2020, respectively, with no real guarantees that those dates will be met.

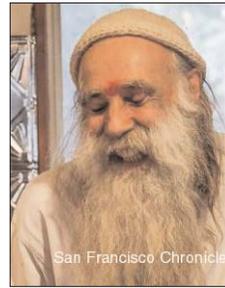
But the company keeps trying; recently it announced that it had teamed with General Electric and Hitachi on developing a new fourth-generation class of reactor code-named PRISM. “PRISM is a small modular reactor, or SMR, with several unique capabilities baked into its design,” says a November 15 Motley Fool article by Maxx Chatsko. “It’s smaller than a traditional nuclear reactor, so it can be manufactured and partially assembled in a factory before being shipped to site for installation, greatly reducing costs for deployment (a major obstacle facing traditional nuclear reactors). It boasts a passive safety system that automatically shuts down the reactor if the temperature rises to a certain level, essentially making it meltdown proof. The fission reaction itself triggers the shutdown. And as a fast reactor, PRISM more fully uses the energy available in nuclear fuels — 95% of which is untapped by traditional nuclear reactors.”

Southern has also spent billions on the Kemper coal-gasification plant, which is supposed to capture and sequester a minimum of 65 percent of the CO₂ from the coal; as of October the project was more than two years behind schedule.

But wait; there’s more. On November 17 Southern subsidiary Southern Power and SunPower Corp. announced that Southern Power has acquired a controlling interest in the 100-MW Boulder Solar I Facility in Nevada from SunPower, which will own the remaining interest in the project.

You’d think that those folks would get discouraged, but you have to give them credit for at least trying, even if many of the projects don’t pan out immediately. And as long as they keep paying their dividend, I’m not going to worry too much, even though their shares are down these days.

THE VCs ARE COMING! By California Pete



Sixty percent of the Marijuana consumed in the U.S. is grown in California’s Golden Triangle of Mendocino, Humboldt and Trinity counties. One would think that the recent referendum that legalized the recreational use of pot

would make those growers, many of whom seem to be recycled hippies and other small operators (and who tend to be *very* laid back), giddy with anticipation of the increased market. Instead, many of them are worried (seriously, how worried can you be if you’re permanently stoned?) that larger commercial interests will move in and push them out. A November 17 article by Peter Fimrite in the *San Francisco Chronicle* says, “there is little doubt among cannabis connoisseurs that many small farmers are going to suffer as the state prepares to license pot businesses and levy a 15 percent excise tax on sales starting Jan. 1, 2018. Marijuana prices have already plummeted from about \$3,200 a pound a decade ago to between \$1,200 and \$1,600 today, making it harder for mom-and-pop gardeners to turn a profit.

“The prices are expected to drop even further once a regulatory framework is established and the loosey-goosey bud trade of the past two decades is no longer kosher. Crops in forests or other places not zoned for agriculture will be restricted, while standards for growing, labeling and using water will be implemented.

“The measure will also tax growers \$9.25 for every ounce of bud they produce.”

The ultimate fear is that high rollers, bankrolled by venture capitalists, will buy up land and become the only ones able to afford the hassle and costs of the new regulations. What will happen to the North Coast if the small pot farmers are driven out? Aside from tourism, there hasn’t been much other economic activity up there since the logging industry went away.

CA goes into panic mode after election

The pot farmers of the Golden Triangle aren’t the only ones worried about the results

of the recent election, of course. The election of Donald Trump and Republican control of both houses of Congress, has the liberals in a panic. The #Calexit folks, who advocate secession from the United States, are getting more attention than usual. A reading of their manifesto (www.yescalifornia.org) suggests that the organizers of the effort may have been consuming a bit too much of the aforementioned California product.

We're number 1?

Would California be a paradise if it became its own country? San Francisco, Oakland “and their surrounding neighborhoods topped the list for having poor roadways for the second consecutive year, according to a study conducted by the Washington, D.C., group Trip,” says a November 2 *Chronicle* article by Kimberly Veklerov. “San Francisco and Oakland had a whopping 71 percent of roads in shoddy condition, more than 10 percentage points higher than the Los Angeles area, which was the runner-up.” Philadelphia is ranked at 23, with 38 percent of roads in poor condition.

Potholes and bad pavement aren't much of a concern if you're on foot, one would think, but SF has another problem: used syringes and human feces are everywhere, mostly the results of the thousands of homeless folks: “Reports of improperly discarded syringes have jumped 41 percent since last fiscal year, according to a recent city controller's report. Complaints about feces have increased by 39 percent, with every district seeing a rise in the calls,” according to a November 1 *Chronicle* article by Lizzie Johnson. And while one might expect places like San Francisco's famous Tenderloin neighborhood to be the worst, complaints are up more than 70 percent in many other areas.

The great departure

California may not secede, but lots of Californians are voting with their feet: according to CNN Money, “For every home buyer coming into the state, there are three Californians selling and moving elsewhere, according to data analysis firm CoreLogic.” It's just too expensive for the non-wealthy; and the money from selling even a modest house here would buy a small mansion in other

parts of the country. The median home price state-wide is \$428,000, and in SF it's more than a million dollars. For details, go to <http://money.cnn.com/2016/11/04/pf/people-moving-out-california/index.html>.

COMING EVENTS

SAE 2016 Vehicle Electrification and Connected Vehicle Technology Forum

Nov 30-Dec 1, Shanghai. Go to www.sae.org/events/vept/

National Biodiesel Conference and Expo

Jan 16-19, San Diego. For info, go to <http://bioconf.us/default.aspx>

SAE 2017 Hybrid and Electric Vehicle Technologies Symposium

Feb 7-9, 2017, San Diego-Mission Valley, CA.

Green Truck Summit

March 14-17, Indianapolis. Held in conjunction with The Work Truck Show; go to www.worktruckshow.com/WTS/GreenTruckSummit/WTS/GTS/GreenTruckSummit.aspx

WCX 17: SAE World Congress Experience

April 4-6, Detroit. www.wcx17.org/

ACT Expo 2017 - Alternative Clean Transportation

May 1-5, Long Beach, CA. For info go to www.actexpo.com/

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 are held in Room 49, Plymouth-Whitmarsh High School, 201 East Germantown Pike in Plymouth Meeting, PA, and begin at 7:00 p.m.

December 14

January 11

February 8

March 8

April 12