

Electric Auto Association



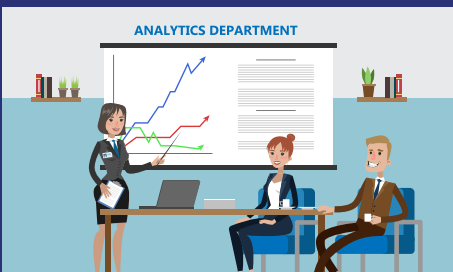
Current **EV**ents

August 2019 Promoting the use of electric vehicles since 1967 Vol. 51 No. 8

The Beginning of a New Revolution!



The Volkswagen ID 3 is the first of a new generation of VW electric cars, with a range of almost 350 miles. Attracting attention at the LA Auto Show, it seems to stand out among other ID concepts, seemingly something to look forward to in 2020. <https://www.cnet.com/roadshow/news/vw-id-concept-los-angeles-auto-show/>



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Current Events Back Issues

The EAA has put most of its issues from 2001 to 2019 on its website.

Please visit

<http://electricauto.org/> and from the home page, click on "Documents" in the top navigation bar. You will see the document library. Click on that to reveal a listing of years (in a folder), which, when selected, will list the issues for each month. In that folder you will be able to download the PDF that contains the issue you choose.

National Drive Electric Week – It's Electrifyingly Exciting!



Photo Credit: Mike Pace

EAA member Kent Bullard describing the features of his 2015 Nissan Leaf to interested attendees at National Drive Electric Week event, Channel Islands Harbor, CA, Sept. 11, 2016.

As we lead up to National Drive Electric week (NDEW) <http://driveelectricweek.org/>, let's remind ourselves of how far we have come. Our events across the U.S. and Canada have impacted millions over the decade that we have been doing this. Sometimes quickly, sometimes more slowly. Our dream of the widespread adoption of electric vehicles is being realized. In fact, Electrify America has a new site, called <http://normalnow.com/>

The power of our volunteerism is in our stories. So, let's fine tune them. As we prepare to engage the EV curious, think about your life before. At one point we did love our gas cars. Then something happened, we learned, we questioned, we experienced the driver's seat, and we switched. It's important to remember the "before" times, so that we can speak to people from the place where they are right now. Remember, for many of these interactions, you are talking to someone who may still love their gas car, just as you did.

Another important principle to remember is that what we are really educating about is the *fuel source*. Car buyers are still buying a car. This may sound overly simplistic. However, we need to establish common denominators with people. Some

people do not even know that EV stands for electric vehicle. Ninety per cent of questions are around charging. We want to speak of charging as something they already know about. We plug in our phone; we plug in our car.

It can be very useful in the first few minutes to find out their obstacles to buying an EV.



Raejean Fellows

Question 1: "Have you had a chance to drive an EV yet?"
Listen:

Question 2: "What has been holding you back from driving an electric car?"

Words we use are important. Let's help them learn more about *cleaner, electric fuel*. As for shopping for cars that have this *smart, cleaner, electric fuel*, we recommend Plug In America's shopping assistant and dealer finder tool. <http://plugstar.org/>.

City Captains of NDEW events will be receiving Electric Auto Association's rack card to display, and hand out. This educational card invites the EV curious/enthusiast to membership in the warm and welcoming EV community. We are the place they can talk to EV owners. Importantly, the card has a series of links to get information on Shopping, Charging, and Incentives. If your chapter has a supply of "Ask me about my EV" pins, these are great to wear to let people know you are available with answers. For even greater reach, some chapters give the pins away to EV owners who visit their booth.

Most of all, what counts in consumer engagement is our enthusiasm and authenticity in just telling our own stories in our own voices. Let's all have fun, educational conversations, and make a big impact across the U.S. and Canada to advance adoption of electric vehicles, as only Electric Auto members and its partners can do!



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for Individuals, Groups and Organizations

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Compare electric cars with comprehensive full page profiles



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Save thousands of dollars on EV purchases and leases



Educational Exhibits

Large scale interactive exhibits for indoor and outdoor events



Electric Car Guest Drive

Test drive the latest EVs and learn from EV owners



EV Navigator

Activity framework to guide prospective EV drivers on the path to EV ownership and advocacy

ECI creates educational resources to promote EV adoption from awareness to advocacy. Email or call us for a complete catalog of products and current pricing.

sales@electric-car-insider.com

619-337-4589

The EAA's diverse member base has increased widely as a community from its humble beginnings. Our chapters include people of like mind and experience and offer wide levels of engagement for meeting attendees. We encourage visitors and discuss topics from EV basics to alternative approaches in EV problem solving. We are presenting this monthly column to better share news, views and achievements from all our chapters as well as your board to communicate activity in this rapidly evolving field.

◆ Electric Auto Association Granted Trademark

The U.S. Patent and Trademark office has recently granted the Electric Auto Association a trademark: **EV Educate™**

Having been founded in 1967, Electric Auto Association is the oldest non-profit organization educating the public about the benefits of *driving electric*. We are proud of this legacy.

◆ Chapters Tapped for EV Educator Experience

The Electric Vehicle Association of San Diego [<http://www.SanDiegoev.Org>] was called upon to offer EV learning experiences to the “Green Team,” a summer youth program sponsored by San Diego Gas & Electric (SDG&E) and administered by the non-profit, *Grid Alternatives*: <https://gridalternatives.org/>.

Elaine Borseth, Chapter VP, gave an EV 101 talk to orient the eighteen students to electric cars. Riding in the EVs excited the students who insisted on riding in all five EVs.

Chapter volunteers displaying and giving rides were: Larry Emerson, Justin Ochoa, Kathy Nicholson Ochoa, Guy Weathersby, Anton Maes and John Irwin.

The students used what they learned to engage the public at an EVGO charger “Ribbon Cutting for DC Fast Chargers” event on July 27th at a popular mall with over a thousand in attendance.

The big takeaways from the experience:

- The students unanimously agreed they felt better informed and ready to educate the public about the benefits of driving electric.
- One of the college students said he was going to use his stipend to buy a used electric car.
- They all want to own EV's when they get older.



“Green Team” Students learning about EVs

◆ EV 101 Talk for Japanese Exchange Students

Japanese educational consultant, Koko, approached the San Diego chapter interested in educating two groups of 40 students from Japan on exchange this summer. These high school students wanted to learn how San Diego is developing itself as a smart city especially, energy efficiency and sustainability.



Japanese Exchange Students

Koko wrote, “We believe that [an] EV is part of [an] important role to build an environmentally friendly city and smart city. Since EV is not a popular system in Japan yet, it would be a great opportunity for the Japanese students.” *continued next page*

◆ EAA Members Get Paid as EV Educators to Provide Test Drives

Electric Car Insider, winner of the EAA 2018 Entrepreneur of the Year Award, has been busy moving EVs and EV educators around the country performing Ride and Drives. Several chapters and their members have been especially helpful in providing their cars, time and expertise to make these events happen with the greatest variety of EVs for the public.

Our members are generous with their time, and do so regularly on a volunteer basis. However, *Electric Car Insider* has funding for their Ride and Drives and is able to offer pay for EAA EV owners/educators. Another example is the Electric Car Guest Drive (ECGD) event held in Detroit recently.

Thank you to the Chapters and members who have been especially helpful. It takes a community working together for the biggest impact.



This is the Detroit Energy Headquarters in Downtown Detroit where ECGD gave Ride and Drive and EV education.

◆ Plug In America to Deliver Awards

Plug In America recognizes outstanding achievements of EV advocates around the country. A private ceremony in Los Angeles on the Mayor's floor will celebrate these special people. We are especially proud of our Electric Auto Association members who will be lauded on September 10th. The ceremony kicks off **National Drive Electric Week**. Congratulations to the EAA Member Winners.

Duff Mitchell – City Captain Award

Duff Mitchell, President of the Juneau Electric Vehicle Association, is organizing his sixth Drive Electric event in Juneau, Alaska this year. Among his efforts, he involves the city government to have local officials express their support and he uses drone technology to demonstrate the growth of these events and of EV adoption in Juneau.

Sam Bona – Student Award

Samuel Bona developed an interest in EVs for environmental reasons and has worked part-time for a used EV dealer in Utah, using his great communication skills to influence consumers to purchase EVs. He will begin studies at Utah State University this fall and plans to pursue education connected with transportation electrification.

Russell Corbin – Student Award

Russell Corbin, a Richard Montgomery high school student from Silver Spring, Maryland, is a young EV activist that has been attending EV events since 2015. He has coordinated other teen volunteers for National Drive Electric Week events, organized EV events at his high school, and served as the environmental affairs coordinator for the Montgomery County Regional Student Government Association.

Russell created a video to invite students to his event: See page 47 of this issue for more info about him. https://youtu.be/C48PCC8_LnQ

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Nikki Gordon-Bloomfield – Marketing/Awareness Award

Nikki Gordon-Bloomfield is the founder and lead presenter of Transport Evolved, a website and YouTube channel that presents news and information about electric vehicles. Nikki is one of most well respected, and followed Youtube journalist/personalities. Distinguished by her British accent, and authentic voice, Nikki is respected for her objective, interesting content that speaks to over 95,666 Subscribers, totaling 1108 Videos to date.

Ken and Gabrielle Adelman – Lifetime Achievement Award

Ken and Gabrielle Adelman have been driving EVs since they first leased an EV1 in 1997. Their philanthropy has supported EV advocacy efforts. Much of the public policy that exists today would not have happened without their involvement.

Chelsea Sexton – Lifetime Achievement Award

*Chelsea Sexton was a sales associate with GM during the launch of the EV1 and a leader in the fight to save that and other early electric vehicles, as shown in the 2006 documentary *Who Killed the Electric Car?* She is also a founder of Plug In America.*

◆ **Regional Conference Calls Enable Sharing By Leaders**

Charles Gerena, chapter liaison for the Electric Auto Association Board of Directors, held conference calls with regional captains in May. If you would like to get in touch with your captain – there are 3-4 of them for the Eastern, Central, and Western regions – contact ChapterVoices@electric-auto.org.

The call for **Eastern Regional Captains** on May 12, 2019 included Jesse Rudavsky and Ed Norris of the New England EAA, Tim Benford at Drive Electric Dayton, and Ron Kaltenbaugh of the EVA of Greater Washington, D.C. Here is some of the information they shared:

- Consider buying a feather flag or canopy with your chapter's logo for events.
- Discord and Slack are online chat platforms that you can use to stay in touch with members, especially chapters that cover a wide geographic area. Live streaming of chapter meetings could be another option.
- It would be helpful if the EAA provided information on what online services chapters use, and put subject matter experts together with creative professionals to produce polished materials for events. [Ed: Another idea – getting those SMEs to help a new chapter learn how to do live streams.]

The Central Regional Captains call was held on May 11 with Dave Hanson of the Houston EAA and Mike Arkwright of the Iowa ESAA. Here are some learnings from that discussion:

- Normally, the organizers of a public event make the decision on cancelling the event due to bad weather. However, a chapter may have to cancel if its members will be uncomfortable and have a bad experience.
- Relying on donations from chapter members to purchase event materials or pay registration fees for certain events is an approach that seems to work. Or, if you're handy, you can make your own event materials, such as a frame made from PVC pipes that can hold up banners when you can't place stakes into the ground.

continued next page



The Western Regional Captains held their call on May 5, including Bruce Nyden of the San Juan Islands EAA and Elaine Borseth of the EVA of San Diego. Here are some of the topics that came up during that conversation:

- Encourage chapter members to follow and engage with the Facebook pages for the EAA and their chapter. Boosting the number of active followers helps get funding and move the needle on policy.
- The EAA and individual chapters should consider reaching out to the Sunrise Movement <https://www.sunrisemovement.org/about>, and young people in general. It would be helpful if the EAA provided training to help chapters conduct such outreach.
- It would also be useful for chapters to share their development efforts. How do they get funding — additional member fees, sponsorships from local companies, utility companies? Also, large donors to local chapters could be recognized on the national level.

◆ Here We Grow Again . . . Three New Chapters

It all starts with leadership. A new chapter simply needs a couple of EV enthusiasts who are willing to put their organizational leadership talents to work to benefit EV Adoption in a larger way than single membership. What a gift to us all. Thank you and welcome to the new leaders. We are here to support you.

Tulsa, Oklahoma **EAA of Oklahoma**

President: Doug Duke
VP: Adriane Jaynes
Treasurer: Adam Dorety
Secretary: Bob Strattan

Eugene, Oregon **Emerald Valley Electric** **Vehicle Association**

President: Phil Barnhart
VP: Al LePage
Treasurer: Betzi Hitz

San Bernardino, California **Inland Empire Electric** **Vehicle Association**

President: Robert Nuenke
VP: Michelle Pierce
Treasurer: Dan West

Please take a minute to send them a big friendly, *EAA Welcome Aboard!*

Here are their emails: michellep@evnirvana.com,
eaafok@outlook.com
phil@philbarnhart.com



SAVE THE DATE! **Annual Awards, Board of Director Elections** **and Meeting**

Electric Auto Association Annual Meeting,
Saturday, January 25th, 2020
Google Community Space, San Francisco, CA

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- Use as EVSE cord or J1772 Extension
- 10AWG Power and Ground

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www.TucsonEV.com or EV@TucsonEV.com

Feb 2019

EV Myths and Savings

By Josef Appell, and Lee Gasper-Galvin, WIEVA

EV Myths

1) More CO₂ is put into the atmosphere in the manufacture of an EV than the manufacture of an internal combustion engine (ICE) vehicle

True, but depending on the size of the battery, the overall EV CO₂ emissions break-even point with ICE vehicles is estimated to be 6-16 months of average driving, according to a report by the Union of Concerned Scientists (based on studies of a 24-kWh Nissan Leaf and an 85-kWh Tesla Model S). [1]

2) The lithium batteries are major polluters.

At the present time, it is true that systems are in place for much more efficient recycling of lead acid than of lithium-ion batteries. Lead acid batteries are 97% recyclable, yielding materials that can be incorporated into new batteries. [2] Retrieving lithium from Li-ion batteries, and recycling it into new batteries, may not be economically feasible: with lithium comprising only about 3% of the cell mix, its retrieval may never reach break-even levels. If the purity of the retrieved lithium is less than 99.5 %, then it is not suitable to be used as a raw material for batteries. [3]

Tesla, however, claims that it is building a recycling facility at their Gigafactory in Nevada, which will recover and reprocess lithium, cobalt, copper, aluminum, and steel into new batteries. Tesla is currently sending old battery packs to third-party recyclers, such as Umicore in Antwerp, Belgium. [4]

It should be noted that lithium from recycled batteries can also be used for non-battery applications, such as lubricating greases that are found in WD-40® “Specialist®” and other products. [3]

Lithium-ion batteries may last more than 10 times longer than deep cycle lead acid batteries before being recycled, greatly compounding their environmental advantage. [5,6]

Meanwhile, the environmental footprint for petroleum processing is far greater. In particular, **tar sands petroleum production requires 34% of its final available energy for its production**, i.e. 2.3 units of tar sands energy produced per unit of energy consumed. [7] Compare this with the pre-

fracking 1990s oil fields returning between 18:1 and 10:1 of oil energy produced per unit of energy consumed to produce it, and we can see that the petroleum energy production is getting much less efficient over time. [8]

Furthermore, think about the massive pollution caused by the oil industry, e.g. the Valdez oil tanker spill, the Deep Water Horizon accident (if you haven’t seen the “Deep Water Horizon” movie—please do!), and the toxic chemicals that are added to millions of gallons of water for fracking and then injected deep into the ground from where they may eventually leak into major aquifers.

The takeaway is that the “cradle to grave” environmental footprint for EVs is simply smaller than that of fossil fuel vehicles.

3) Lithium is a fire hazard, and should be avoided.

First, get rid of your cell phone if you truly believe that. True, cheap products that may have defects in or misalignment of their separators, lack proper charging cut-off switches, and do not have properly designed Battery Management Systems (BMS) are fire hazards. Although the exact cause of the hover-board and Boeing 787 fires were not able to be determined, proper quality control on all of these fronts can generally mitigate the risk of fire.

For fossil fuel vehicles, the NFPA (National Fire Protection Agency) report varies from year to year. During 2007-2011, there was an average of 229,500 ICE car fires annually, which killed an average of 328 civilians each year.

There have been only about 14 Tesla vehicles which have caught on fire since 2013, up through April of 2019 – that’s an average of less than three per year, and yet the negative press and opinions quickly spread. The media are actually doing a grave public dis-service by taking the focus off of the real, long term, unsolved problems, of gasoline (and diesel) dangers. (Who has forgotten about the exploding Pinto gas tanks?) Tesla says that its vehicles are 10 times less likely than ICE cars to experience a fire, based on its fleet of over 500,000 vehicles which have driven more than 10 billion miles. [9]

One of the main reasons for the Li-ion battery fires is that commercial Li-ion batteries contain flammable organic solvent electrolytes (typically with added lithium-containing

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EV Downsides

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salts), which burn when heated in the presence of oxygen. Current research is being conducted in an attempt to replace these organic electrolytes with solid-state electrolytes which are not flammable. [Ed: such solid state electrolytes promise quantum jumps in capacity and durability for cells.]

4) EVs use electricity produced by burning coal, and therefore are no better than, or worse than, fossil fuel vehicles in terms of greenhouse gas (GHG) emissions.

It is true that there is a “dirty grid” consideration, particularly for certain regions of the country, i.e. Illinois and the upper Midwest, but not for the nation as a whole. If a direct comparison were done for all electric vs all fossil fuel vehicles across the lower 48, there would be far less pollution even with the coal fired electrical plants (which are being slowly, but steadily, de-commissioned). For further clarification, and the ability to break this down by regions of the United States, refer to: https://www.afdc.energy.gov/vehicles/electric_emissions.php

Very critical to understanding why the grid is as it is...even today, with the fossil fuel industries being centuries old, we paid \$10.7B during 2015-2016 to Big Oil in subsidies [10]. Big Oil and Big Coal do not want you to change, and so far, their political contributions have worked. However, they are using Big Tobacco’s play book, and we all know how that went.

Bottom line, it is not Tesla’s (or any EV manufacturer’s) fault for the poor state of our dirty grid...it is the fault of Big Oil, Big Coal, and politicians that take massive contributions, and keep voting against clean energy.

No matter how you produce the electricity (except for electricity produced via fuel cells fed with hydrogen produced by electrolysis fueled by the dirty grid), EVs will always win on producing lower levels of air pollution and CO₂ emissions than vehicles burning gasoline! This is partly because oil refineries use so much electricity (frequently from the dirty grid) to produce gasoline. Also, most electric motors are over 90% efficient, with some of the newer motors having efficiencies as high as 95-97%. Compare that with the internal combustion engine, which typically has a 20-30% efficiency (which is why your engine gets so hot during use—much of the energy of the gasoline you feed into it gets wasted as heat).

Savings

- Driving an EV can save you money in ways that most do not consider. Plus, the elimination of the parts, fluids, and the transport of the items listed below will serve to reduce maintenance costs and/or greatly reduce the use of fossil fuel.
- With an EV, as with a fossil fuel vehicle, you will need tires, tire rotation, cabin air filters, and wiper blades. The similarities end there.
- There are brakes to be replaced on EVs, but regenerative braking greatly reduces the frequency at which new brake pads are needed. I (Josef) changed mine on my Prius at 160,000 mi, and still had 25% of brake pad life remaining.
- You will not need brake fluid, master cylinder, or any brake lines. The brakes are electrically operated solenoids.
- The steering is also electronic, eliminating the power steering fluid, pump/master cylinder, and [high pressure] lines.
- No transmission, transmission fluid, belts or [clutch] plates, mechanical or electronic linkages.
- No exhaust header, exhaust pipe, muffler, catalytic converter, or tail pipe(s).
- No radiator, thermostat, water pump, or hoses. And, no poisonous ethylene glycol radiator coolant! [Ed: Modern EVs use liquid cooling systems but are not running at elevated temperatures and pressures as ICE engines do.]
- No engine-driven air conditioning compressor. It is electric, and away from the engine compartment (and related problems).
- No timing chain, individual belts, or serpentine belt, for all the systems mentioned above.
- No oil change, oil filter, or oil pump, and no engine gaskets.
- No air filter, fuel filter, spark plugs, electronic fuel injection (EFI) unit, plug wires, or several other very expensive ignition system components. And no starter motor.

continued next page

Downsides of EVs?

The downside? Industry, trade schools, and people will need to adapt, just as they did when the horseless carriage took over. Career re-training will need to be offered, and hopefully, it will see greater than the <20% participation currently seen in southern Pennsylvania, where there are still mineable coal reserves. The reason cited by coal miners there for not taking advantage of career re-training, is that they think coal jobs are coming back. [11]

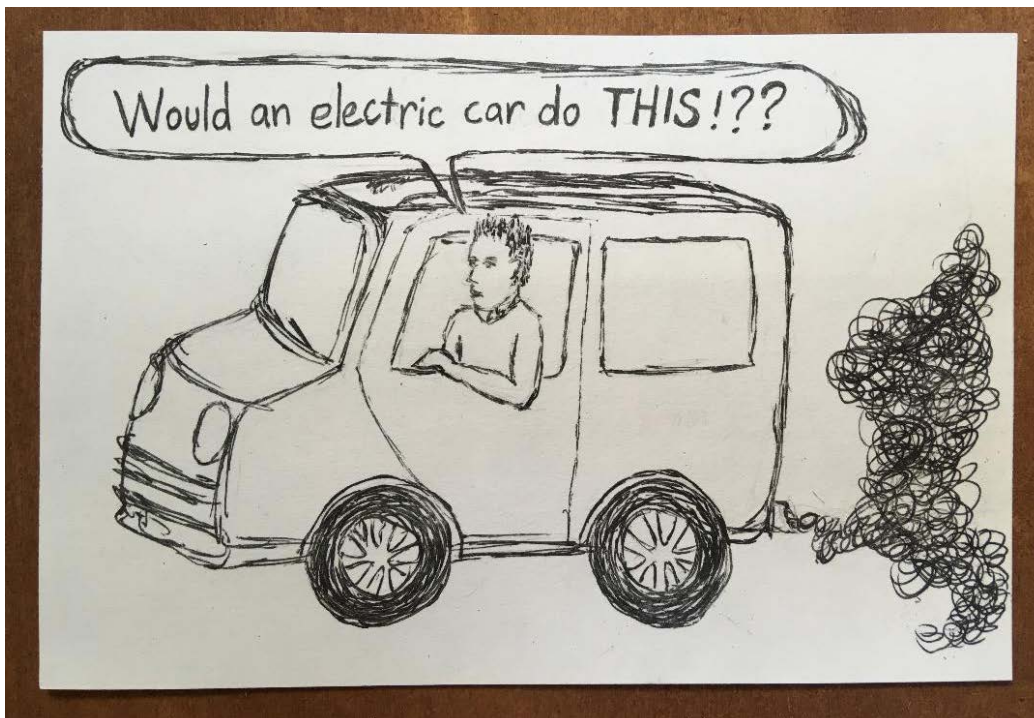
Part of the reason that the traditional multi-million-dollar car dealerships are fighting the advent of EVs, is because they make most of their money on repairs, not on sales of vehicles. The threat of EVs coming forth in a big way is that they will dig deeply into their protected distribution and long-entitled warranty and recall work, which were often performed at huge profits! But EVs will be a huge win for the consumers.

The future widespread use of rooftop (photovoltaic) solar panels will ultimately make it possible to drive on sunshine! Elon Musk and the Tesla team, as well as many others worldwide, are working hard to make this a reality.

- [1] “Cleaner Cars from Cradle to Grave: How Electric Cars Beat Gasoline Cars on Lifetime Global Warming

Emissions”, by Rachael Nealer, David Reichmuth, and Don Anair, Union of Concerned Scientists, November 2015, p.1.

- [2] https://batteryuniversity.com/learn/article/recycling_batteries
 [3] https://batteryuniversity.com/learn/article/battery_recycling_as_a_business
 [4] “Apple, Tesla develop recycling technologies”, Chemical and Engineering News, April 29, 2019, p. 15.
 [5] Brant, Bob, “Build Your Own Electric Vehicle”, Tab Books (a division of McGraw-Hill), New York, 1994, p. 226.
 [6] “Tesla Batteries have 90% Capacity after 160,000 mi, May Last for 500,000 mi”, Steve Hanley, April 16, 2018.
 [7] “Oil Sands Mining Uses Up Almost as Much Energy as it Produces”, Inside *Climate News*, Feb. 19, 2013.
 [8] “The Crash Course”, Chris Martenson, John Wiley & Sons, 2011, p. 133.
 [9] “Tesla investigates video of Model S car exploding:”, *The Guardian*, April 22, 2019.
 [10] <https://www.fueelfreedom.org>
 [11] <https://www.reuters.com/article/us-trump-effect-coal-re-training-insight-idUSKBN1D14G0>



This cartoon is drawn and copywritten by Marie Nicole Galvin. It is for EAA to use with her permission

Last month in July 2019 CE’s page 42, Veloz offered us their video [<https://www.youtube.com/watch?v=rXodSqMpuUQ&feature=youtu.be&t=49>] created featuring Arnold Schwarzenegger plugging EVs. Named Howard Klein (German for small) he tries to sell EVs by pushing the opposite. Inspired by this, Marie Nicole Galvin lampoons one of his angles. The graphic she parodies in this cartoon came from that video at this time: <https://youtu.be/rXodSqMpuUQ?t=108> He pulls up in the belching Hummer and that’s what Marie drew from.



Tesla Model 3 Owner Implants RFID Key Card Chip Into Her Arm as Ultimate Hack to Unlock Door



By Dacia J. Ferris

Tesla owner, maker, and software engineer Amie DD has undertaken the ultimate hack: Implanting the chip from inside her Model 3 valet key card into her arm.

The idea for the Tesla bio implant, as described by Amie, came from an RFID chip she already has inside her hand that connects to her personal website and front door lock. “It’s just basic access control. If I were to tap my hand to your phone, it would automatically open a browser and go to my web page,” she explained in her video on the project. After pre-ordering her Model 3 and learning there was a key card with an RFID chip, she was inspired to connect her current chip to the new car.

Since Tesla’s chips are pretty secure, Amie had to adjust her original plan to copy its software onto her existing RFID chip and install the Tesla chip



The Tesla Model 3 valet key card chip location in Amie DD’s arm. Image Amie DD/YouTube

into her arm as a second bio implant. “I can get a lot of information about the Java Applet that it runs on, but I can’t take that information and write it to my current chip. So, it’s pretty secure. Good job, Tesla,” she explained. Of course, there were some challenges along the way, mostly with people doubting her ability to accomplish her goal.

“They [said] oh, you can’t like, start your car with that. It’s not secure, it won’t work. And it makes me want to do it more...because...it makes me question why. Like, why can’t you do it that way? What are the limitations?” she recounted. “And it actually makes me research it to be able to reverse

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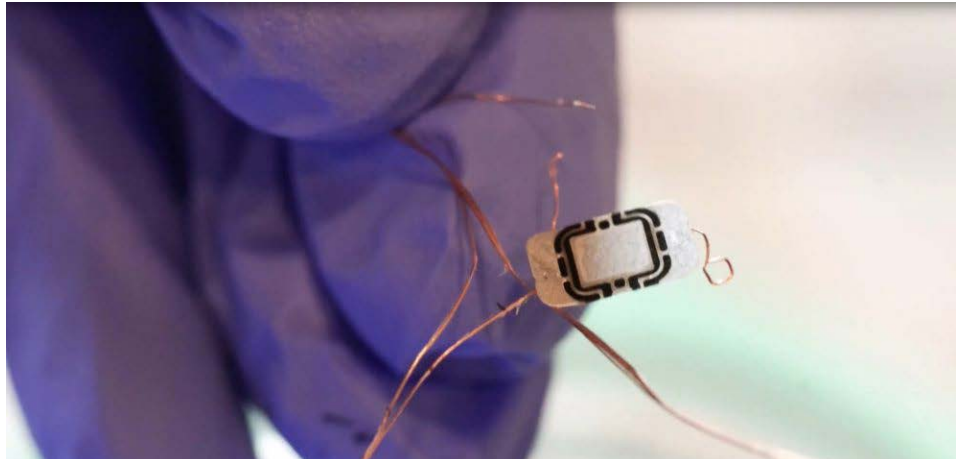
engineer it, understand how it works, why it works that way...and then at the end, it's like going to the candy store... I did it, it's like the Sword of Destiny."

To obtain the chip from the valet key, Amie dissolved the card's plastic in acetone. She then had it encapsulated in a biopolymer to make it safe for her body, calling in the expertise of Amal Graafstra of DangerousThings.com, a company specializing in "biohacking" and RFID chip implants. Finally, Amie's chip was implanted by a studio experienced in body modification called Shaman Modifications. "I talked to a few doctors, and they were a little leery about doing this because it's kind of a...questionable thing," she noted.

Amie's background goes well beyond turning her Tesla Model 3 valet key into a bio implant. She's a self-described maker, builder, and "Magical Unicorn Software Engineer" whose projects include 3D printing, electronics, and cosplay costuming and accessory design. She regularly publishes video tutorials on those same topics and runs an Etsy store where she sells goodies like 3D printed cosplay items and unique LEGO gifts. Professionally, Amie has a background in Game Programming and Simulation and started her career at Marvel Studios, working on Captain America and X-Men Destiny. She later transitioned to Research and Development for development work on the Xbox and Playstation, as detailed on her website.

The full details and project diary for Amie's Tesla Model 3 implant hack are additionally published on Hackaday, for anyone interested in either following along with her software/bioengineering or perhaps...interested in their own Tesla implant?

In accordance with Title 17 U.S.C. Section 107, this material is distributed without profit to those who have expressed a prior interest in receiving the included information for research and educational purposes.



The Tesla Model S valet key card chip from Amie DD's car that now resides in her right arm. (Image: Amie DD/YouTube)

Watch Amie DD's two full videos explaining her Tesla Model 3 bio-hack in this article. [Warning: The second video has the implant procedure, which may not be for the squeamish.]



The Tesla Model 3 Hack



Tesla Model 3 Chip Install - WARNING THERE IS BLOOD (Image: Amie DD/YouTube)

<https://www.teslarati.com/tesla-model-3-owner-arm-bioimplant-rfid-keycard-chip/>

Ashland is a Leader in Electric Vehicle Use



James Stephens tows his solar trailer with a tesla. *Daily Tidings / Jamie Lusch*

By John Darling For the Tidings

James Stephens of Ashland not only has a Tesla EV, he built himself a solar travel trailer to extend its 325-mile range for vacations.

At ElectroQuest, his 20-year-old business, he devotes himself to research and marketing electric vehicles, sustainable energy generation and heightened battery storage.

His EV passions are contagious. He has partnered with Brandon Lerda of Phoenix in converting Lerda's classic 1939 Ford coupe to EV, with Stephens doing the electric and Lerda doing the mechanical. The car is almost road-ready.

It's obsession like this, according to the Oregon Department of Energy, that has put the state at the halfway mark to its goal of 50,000 electric vehicles by the end of 2020 — and placed Jackson County in the Top 10 counties for EV registration, with 913 post-oil vehicles.

Jackson County has EVs all over; but the hot spot, by far, is Ashland — which,

although it has only 10 percent of the county's population, has 76 percent of its EV registrations, says Oregon DoE.

Assistant City Administrator Adam Hanks says it's because Ashland has decades of history pioneering solar and other sustainable forms of energy, has created its own Climate Energy & Action Plan to shrink the city's carbon footprint, and participates in the state Clean Fuels Program, receiving clean fuel credits for EV registrations and for all kilowatt sales relating to the charging of EVs.

Ashland is in the EV vanguard, adds Hanks, because of "community involvement in the Energy Action Plan. It's got way higher than average interest in town and knowledge for doing something about climate change.

"EV is a direct way to correct fossil fuel abuse, and we have incentive programs for every rebate for owners," he added. "We live in a valley that's compact enough that there's no anxiety about EV range, more types of EVs are

available, and the price has gotten much more competitive in just a few years."

Charging stations a few years ago were a big novelty, but a quick check on the internet shows them all over Ashland and beyond.

Stephens lives six blocks from the city's four free chargers, which are next to Pony Espresso coffee house on Lithia Way, where you can grab a latte and be topped off

on the super-charge in under an hour. Stephens, however, says he likes to plug in, walk home, sleep and have a "full tank" in the morning.

Stephens was always stoked on Tesla, but he says he waited until its range surpassed 300 miles, then he got on a two-year waiting list. He plans to drive it in celebrations of national Drive Electric Week, which is Sept. 14-22.

"I've never driven a finer automobile in my life, fossil fuel, hybrid or electric. It's so wonderful, I just can't describe it. I look forward to the full autonomous model, but it has to be fully regulated by the government."

The city of Ashland's incentives call for grants to nonprofits and businesses for workplace EV charging, says Hanks. Safeway market now has two chargers, and the city is incentivizing by offering rebates to motels, restaurants and other businesses that install charging stations, based on the number of parking spots.

Details are at www.ashland.or.us/EV.

<https://ashlandtidings.com/news/top-stories/ashland-is-a-leader-in-electric-vehicle-use>

Chevy's 2020 Bolt EV will pack a longer 259-mile range



Roberto Baldwin/Engadget

By Jon Fingas

Chevy hasn't tweaked the Bolt EV much since its introduction, but an impending refresh could be welcome by giving drivers what they often crave: more range. The EPA has rated the 2020 Bolt EV as delivering 259 miles of range, up substantially from the 238 miles you've seen since the start. As *Car and Driver* observed, that would give it greater longevity than the Tesla Model 3's Standard Range Plus trim (240 miles), the Kia Niro EV (239 miles) and the Hyundai Kona Electric (just shy at 258 miles).

It's not certain just how Chevy wrung out that extra 21 miles of driving, but C&D understood that new battery chemistry was the key.

Don't expect a drastically upgraded car beyond that. The Bolt order guide only makes reference to new color and minor feature options. If you're not

fond of the design, this won't change your mind. Having said that, added range could be enough of a selling point by itself. It can make the difference between having to recharge mid-route

<https://www.engadget.com/2019/08/22/chevy-2020-bolt-ev-longer-range/?yptr=yahoo&guccounter=1>

and making a non-stop trip, and that could reel in buyers who'd either look at other EVs or (gasp) consider a gas-powered car instead.



[If you are interested in more info about the Bolt here is another article from *Car & Driver*

<https://www.caranddriver.com/news/a28784342/2020-chevy-bolt-ev-range/>

Electrify America Is Deploying an Autonomous Fast-Charging Station with Robot Arms for Self-Driving Cars



By Fred Lambert

‘Electrify America announced that it is deploying what will likely be the first autonomous fast-charging station for electric vehicles and it has robot arms.

The EV charging infrastructure company, which was started by Volkswagen as part of its settlement with the US over the Dieselgate scandal, announced an agreement with Stable Auto, a San Francisco-based electric vehicle (EV) fleet charging company.

The plan is to build a pilot demonstration charging site for self-driving and electric vehicle fleets in San Francisco.

Wayne Killen, director of infrastructure planning and business development at Electrify America, commented:

“We believe that reliable, high power electric vehicle charging infrastructure is essential for the accelerated adoption of EVs in the U.S., and recognize that

foundational solutions like DC fast charging can be adapted for different charging needs. Autonomous vehicles will play an important role in the future of driving, particularly with fleets, and tailored charging options for self-driving EVs will be critical to develop that effort. We’re excited to partner

with Stable to be at the forefront of learning more and developing those charging solutions.”

Electrify America plans to use Stable Auto’s robotic solution that consists of a robot arm connected to the charging
continued next page



station charge connector. [Photo bottom of previous page.]

The company described the goal of the pilot project with Stable Auto:

“As part of this agreement, Electrify America will evaluate the hardware, network, operations and billing of its charging systems to best suit autonomous charging fleets. Electrify America has provided two 150kW DC fast chargers to Stable’s charging facility for initial development work behind demonstrating the commercial viability of autonomous charging services for self-driving EVs.”


It is aiming for the station to open in “early 2020”.

Electrek’s Take

We have seen several other similar projects to address charging with autonomous fleets, but this sounds like the most serious one since Electrify America actually plans to deploy it.

Tesla had the robot snake charging cable and an automated high-speed charging with external cooling, but it never did anything with those things.

I also like that Electrify America is making it clear that it is about self-driving and not making current charging solutions more convenient.

Of course, it would do that, but it’s not worth the price. It would be solving a problem that doesn’t really exist since plugging in is not less convenient than going to the gas station. 

<https://electrek.co/2019/08/01/electrify-america-autonomous-fast-charging-station-robot-arms-self-driving-cars/>

Harley Davidson Partners with Electrify America for Fast-Charging Its Electric Motorcycles

[This article was published earlier in July to discuss the effort of Harley Davidson to put into place Fast Charging for its LiveWire electric motorcycle. Below are excerpts from the article. You can access the entire piece through the URL at the bottom.]

By Fred Lambert

Harley Davidson and Electrify America have announced a partnership to offer a fast-charging plan to the owners of HD’s upcoming LiveWire electric motorcycle.

LiveWire owners will receive the “equivalent of 500 kilowatt-hours of complimentary charging over two years at Electrify America stations nationwide.”


... Electrify America aims to have approximately 800 total charging

station sites with 3,500 chargers by December 2021.

Harley-Davidson has updated the production verified specs of the LiveWire earlier this year.

The new city range has been verified at 140 miles (225 km). Additionally, the company has now disclosed a mixed range rating for highway and city riding of 88 miles (142 km).

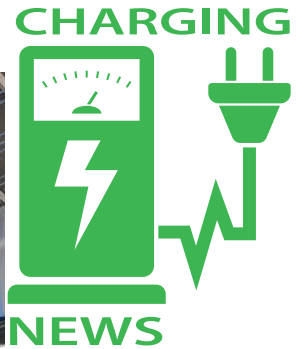
As for the fast-charging capability, HD says that the battery pack can be charged from 0-80% in 40 minutes or 0-100% in 60 minutes.

The electric bike starts at \$30,000 and it is expected to go into production in the coming months. 



<https://electrek.co/2019/07/11/harley-davidson-partners-electrify-america-fast-charging-electric-motorcycle/>

Nissan and EVgo to Add 200 Fast Chargers as More Electric Vehicles Hit US Roads



By Kirsten Korosec

Nissan and EVgo said Tuesday they will install another 200 DC fast chargers in the United States to support the growing number of consumers who are buying electric vehicles, including the new Nissan Leaf e+ that came to market earlier this year.

The 100 kilowatt DC fast-charging stations will have both CHAdeMO and CCS connectors, making them accessible to more EV drivers. The inclusion of both charger connectors is logical; it's also notable for Nissan, once the primary advocates for CHAdeMO chargers.

The announcement builds off of the companies' six-year partnership, which included building out a corridor of EV chargers along Interstate 95 on the East Coast, as well as between Monterey, Calif., and Lake Tahoe.

Nissan says it has installed more than 2,000 quick-charge connectors across the country since 2010.

Plans to add another 200 fast chargers follows the launch of the 2019 Nissan



Leaf e+. The Nissan Leaf e+, which came to the U.S. and Canada this spring, has a range of 226 miles and fast-charging capability.

This new version of the Leaf all-electric hatchback has 40% more range than other versions thanks to a 62 kilowatt-hour battery pack. That 226-mile range puts the Leaf e+ just under the Chevy Bolt EV, which has a 238-mile range, the Kia Niro EV with 239 miles and the Tesla Model 3 standard range plus with 240 miles.

“Given the tremendous driver response to the 2019 long-range all-electric

LEAF, Nissan and EVgo will accelerate fast charging by committing to a multi-year charger construction program that will continue to expand fast-charging options for EV drivers across the country,” Aditya Jairaj, director, EV Sales and Marketing, Nissan North America said in a statement.

The companies also plan to partner on a marketing campaign to sell consumers on the benefits of EVs, and for Nissan, hopefully persuade more to buy its Nissan Leaf Plus. Nissan's July sales figures were down compared to the same month last year, a slump that has affected the Leaf, as well.

<https://techcrunch.com/2019/08/06/nissan-and-evgo-to-add-200-fast-chargers-as-more-electric-vehicles-hit-u-s-roads/>

Plug-Ins Are a Best-Seller In CA For the First Time

Californians snapped up Tesla Inc.'s Model 3 plug-in electric car in the first half of this year, making it the third most-purchased vehicle in the state. The Model 3 trailed the non-electric Honda Civic and Toyota Camry, according to data <https://www.cncda.org/wp-content/uploads/Cal-Covering-2Q-19.pdf> released by the California New Car Dealers Association (CNCDA). It tracks sales and model popularity through new vehicle registrations.

Tesla sold more than 33,000 Model 3s, while drivers bought roughly 33,600 Toyota Camrys and 39,000 Honda Civics. Drivers bought more Model 3s than the Ford F-series truck, a popular option. Ford sold about 25,000 of those in the first half of 2019. Read the rest of this developing story here at: <https://www.eenews.net/energywire/2019/08/20/stories/1061004777>

Tesla Brings Back Free SuperCharging

Tesla announced the beginning of August that it is bringing back free unlimited supercharging with the purchase of a new Model S or Model X.

While certainly a popular announcement for prospective Tesla owners, it conflicts a bit with statements from CEO Elon Musk. The Tesla boss previously said on Twitter that the perk was “unsustainable.”

Free unlimited supercharging was standard with the purchase of a new Tesla in the company’s early days. The company began phasing out free unlimited access in 2017 when it limited the program to 400 kilowatt-hours, or about 1,000 miles, of free charging every year.

Tesla is able to bring back the perk from time to time



as a sales tool. So, while it’s nice to see the offer, who knows how long it will last.

<https://teslamotorsclub.com/blog/2019/08/04/tesla-brings-back-free-supercharging/>

Electric Vehicle Charging Technology: Urban Electric – Pop-Up Charger I Fully Charged



Robert Lewllyn shows this “buried-at-curb-side-disappearing-EVSE” now installed in three British cities. As for why this won’t work here in the US, read the comparison between European and US charging. The primary show stopper is the interconnection scheme they use. Another reason for our not having underground utilities is the up front expense. And with inevitable subsequent changes, it means “dig it up,” again.

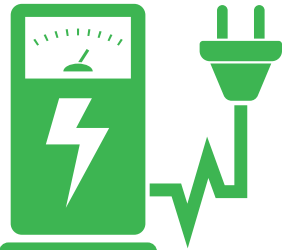
One clear win – the siting of such units doesn’t involve reluctant hosts, one of the biggest challenges many firms are learning about. It’s public right of way, typically municipally owned property!

While a clever innovation, in our opinion this will be a ‘long haul’ for adoption because there is so much effort up front (planning, digging, wiring).

<https://www.youtube.com/watch?v=Frkw6aurVUY&feature=youtu.be>

European Versus North American EV Charging

CHARGING



NEWS

By CE Staff

You may or may not have ever traveled extensively over on continent, but many things are different there. They are just as effective as ours, but notably different. Among the many differences we can include the metric system for measurements, their extensive public bus and rail transit system, the electrical system (AC line frequency is 50 Hertz instead of our 60 Hz.), the appliance connector plugs (which differ even among the countries), to name a few.

EV CHARGING

This too, is different. The standard residential delivery of twice as high voltages is to all appliances, be they household or kitchen appliances, or just a little clock radio on a bed stand. The power they deliver is generally about the same as ours. With 230 Volts at 10 Amps as the typical residential outlet power provision, that is essentially the same as our 120 Volt at 20 Amp power level (2300 versus 2400 watts theoretical maximums). That's where our similarities end.

For power like our SAE Level 1 EV charging, they use the IEC Mode 2 plugs. For higher power, they use Mode 3 equipment. In fact, they have a much cleaner approach. All of their public EVSE require the vehicle driver to use



their own connector cable. With male plugs on both ends, there are no exposed terminals on the charging station — nor on the vehicle. You “Bring Your Own Cord” (BYOC), and keep it in your car. That way no vandals can get to it, and it ostensibly stays cleaner too!

Their public charging called Mode 3 can be a simple two pole with ground plug delivering 16 kilowatts (kW) or 22 kW with 3 phase power, even as high as 63 kW (again 3 phase) with the Mennekes connectors, which conform to the IEC specs, not SAE specs, as in the USA.

Both EVSE-end and Vehicle-side Mennekes Type 2 plugs, used on the typical cord kept in the EV.




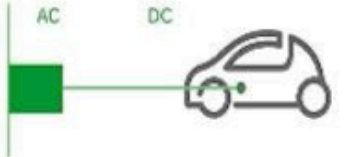
The truly high-power charging in Europe involves using 3 phase AC power source at 415 Volts per phase and at up to 125 Amps. The 3-phase power delivery using this Mennekes connector is typically about 55 kilowatts, delivering well over 75 miles per hour of charging. The choices boil down to 3.6 kW (16 A, single phase to 22 kW (30 A x 3 phase) or 40 kW with 63 A x 3 phase) depending on the EVSE chosen and the EV charging capacity. (You can't force a little 3 kW charger to accept more than 3 kW. It draws what it needs and wants, never more.) For additional information on the Type 2 system, see https://en.wikipedia.org/wiki/Type_2_connector

Things can get messy when you travel in an EV, and have to be prepared with the necessary connectors. But they have effective charging location apps and a unified approach, making things easier. Of course, there are simple exceptions (a Tesla Supercharger has a unique connector, different in Europe and the USA again.)

continued next page



Source connections for the EVSE via a 63 Amp 3-pin Mennekes IP44 plug (for public Mode 3 charging)

	Mode 1. <ul style="list-style-type: none"> • Standard power lead plugged into normal outlet. • Charger in vehicle converts AC to DC and controls battery charging. • Note: Mass manufacturers no longer use this mode as the lead is always live.
	Mode 2. <ul style="list-style-type: none"> • In-line EVSE control box (blue) is part of lead • Lead is plugged into normal outlet (usually 15A) • EV will generally charge at a maximum of 2.4kW (10A). • Charger in vehicle converts AC to DC and controls battery charging.
	Mode 3. <ul style="list-style-type: none"> • Dedicated wall box with control electronics built-in. • Choices between 3.6kW (16A, single phase) to 22kW (30A x 3 phase) and even 40kW (63A x 3 phase) depending on EVSE chosen and EV charging capacity. • Charger in vehicle converts AC to DC and controls battery charging.
	Mode 4: <ul style="list-style-type: none"> • Charger is in the wall box/pillar (converting AC to DC). • Connects via a different socket (three main types) depending on standard adopted by manufacturer. Currently up to 50kW (CHAdeMO), 120kW (Tesla) or 150kW (CCS).

This figure shows 4 modes for EV charging in Europe. <https://thedriven.io/2018/08/28/faq9-ev-charging-speeds-explained/>



Source connection for the EVSE using an IP67 5-pin Mennekes plug with 3 phases, plus neutral and safety ground and can deliver up to 63 kW.

STORY TELLING VIDEO

Take a look at the new Urban Electric (British) curbside charging station video on page 19 which shows a novel approach for MUD or row house resident EV owners, where typically there is no off-street parking available. This underscores again a major difference in the European infrastructure: they have buried most of their utilities. Because their truly ancient houses, often preserved for centuries are unlike the US – installing these takes considerably more effort and planning.

continued on page 24

Euro vs US EV Charging

Continued from page 23

Ever notice how only our newest and most expensive construction projects have underground utilities in the US? In Europe, there are very few overhead wires, and nearly no ugly wiring messes over street corners, shown in the extreme here.

Photo taken in India in 2017 after authorities were faced with angry thieves defending their illegal practice of power theft: [See URL under photo.]

Could the installation shown in this video ever materialize in the US? No, simply because we don't "BYOC". Nor can we deliver our power without incurring exorbitant expenses necessary to underground the power. And lastly, because we don't have a billing system for EV charging costs to be tied back to a vehicle owner they way Europe has (using their apps). Our networking costs are probably three times more than European connectivity.

LIGHTING THE WAY

The best we can hope for is probably having essentially Level 1 or slightly higher power levels available at light poles in cities and towns nationwide, since high pressure sodium vapor street lights and incandescent bulbs are rapidly giving way to LED lighting, thereby leaving power potentially available for a plug on the pole (PoP!)

Until we have tracking of VINs to individual power provider accounts, even that is a distant dream. But it's still fun to watch what other countries are doing to solve their electrification issues.



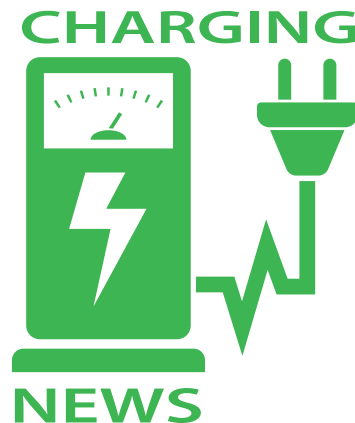
<https://www.news18.com/news/india/delhi-engineer-on-power-theft-raid-dies-after-being-chased-by-mob-1464479.html>

CONCLUDING REMARKS

As the world embraces electrification, charging opportunities abound. Making power connection points conveniently and safely available, however, remains a challenge to the uninitiated. Installation of new EVSE at some locations is met by resistance from landlords, for obtuse reasons often tied to financial concerns. Amateurs who have never dealt with high voltage electrical circuits put themselves and surroundings in danger (as this photo of the illegal pole wiring shows). But one size rarely fits all, and clever ideas such as this British installation are no exception.

Equipment diversity has its appeal. Yet tidy, safe and capable charging connections for the many EV drivers yet to hit the road will require a massive effort.

o-o



Free EAA Presentation Materials



Have you been asked to deliver an EV talk to NDEW or a similar event but hesitated due to lack of prepared presentation materials? We have a solution for you! In conjunction with the **Electric Auto Association's** development of its **EV Educate™** Program we can leverage material for delivering a presentation to your community.

Our slide decks have been used across the country for information presentations to educational institutions, fellowship organizations, utilities, senior clubs and environmental organizations.

The decks provided are not finalized presentations, but as a collection of relevant PowerPoint slides from which speakers can pick, choose, or alter to meet the needs for a specific audience.

EV 101 – The Electric Vehicle Has Arrived

Provides an introduction to EVs on the market now and which might be right for you. It covers what EV owners like about EVs, approximations of costs, available incentives, range estimates and impact on the community.

Buying A New or Used EV – What to Consider?

A strong used EV market has developed providing another option in making the move to electric transportation that can be far less expensive. This deck includes specific tips for considering and evaluating a used EV.

The Surprising Past, Our Amazing Present and Disruptive Future of Electric Cars

A fast paced look at the incredible revolution in our transportation evolution from horses to self-driving cars that promise to change everything. There are two versions available – one for youth and one for adults.

Is Our Family's Health At Risk?

Unexpected discoveries now tell us how fossil fuel cars are substantially impacting the health of our families. This deck includes an introduction to the astonishing microparticles entering our body and how they cause damage from development disorders for children in the womb to dementia in seniors.



To access these slide decks in PowerPoint, contact EAA Board Secretary Guy Hall Secretary@electricauto.org



New Electric Motor Could Boost Efficiency of EVs, Scooters, and Wind Turbines

The Hunstable Electric Turbine by Linear Labs can generate two to five times the torque of existing motors in the same-size package, the company says. By Lawrence Ulrich

[A new motor has been developed by a father/son team which promises incremental improvements for EVs and motor applications everywhere, much like what the internal combustion engine (ICE) saw during its early days. Follow this link for an interesting technical read and see if you can spot the technical goof that was included! It's back to basics for some folks. <sigh>]

<https://spectrum.ieee.org/cars-that-think/transportation/advanced-cars/new-electric-motor-could-boost-efficiency-of-evs-scooters-and-wind-turbines>



Ford Warns Its Upcoming Rivian-Based EV Won't Necessarily Be A Pickup

It sounds like the company will build an SUV on Rivian bones

By Ronan Glon

Ford is well underway in the development of its electric F-150, so much so that the automaker recently showed it pulling a train. When the company partnered with Rivian to develop large electric vehicles using the startup's tech, it seemed likely that the outcome could be another pickup, or that Ford was leveraging Rivian for input on the electric F-150. Not so fast, though, as Company CEO Jim Hackett confirmed the Blue Oval's \$500 million investment in the Michigan-based start-up will spawn a new vehicle, but he warned against speculating it's a truck. Reading between the lines, it seems like Hackett is telling us that the Rivian investment will yield an SUV or crossover, something that will likely be developed in parallel to the ongoing F-150 EV that we still expect to reach production.


"You shouldn't go down the path of assuming it's a pickup," he told Motor Trend during an interview. While he wouldn't reveal precisely what the jointly-developed model will arrive as, Rivian so far specializes in making tall, rugged off-roaders like the R1T and the R1S concepts it introduced during the 2018 Los Angeles auto show. This means the skateboard platform it will let Ford use won't underpin a successor to the Focus Electric. If it's not a pickup, odds are it will be an SUV.

Ford is keeping quiet about its battery-powered off-roader, but work continues behind the scenes, and Hackett added most of the big decisions have already



been made. He also hinted that Rivian will build the model in the former Mitsubishi factory it purchased in Normal, Illinois. That's a courageous move; Ford has over 100 years of manufacturing experience, but Rivian has absolutely none.

On the other side of the pond, where mammoth vehicles like the R1T and the F-150 don't fit in, Ford is leveraging its burgeoning partnership with Volkswagen to quickly bring electric cars to the market. The Blue Oval became the first major automaker to take up Volkswagen's offer to share the modular MEB architecture it's developing to underpin a wide range of electric cars, including a Golf-sized hatchback called ID.3. *Motor Trend* learned Ford ultimately hopes to sell 600,000 MEB-based cars over a six-year period, but additional details remain under wraps. What's certain is that they'll be relatively small, and they won't be available in North America.

All told, Ford plans to release 40 electrified vehicles globally by 2022, including hybrids, plug-in hybrids and 16 battery-electric cars. It's investing \$11.5 billion into research and partnerships to make it happen. 

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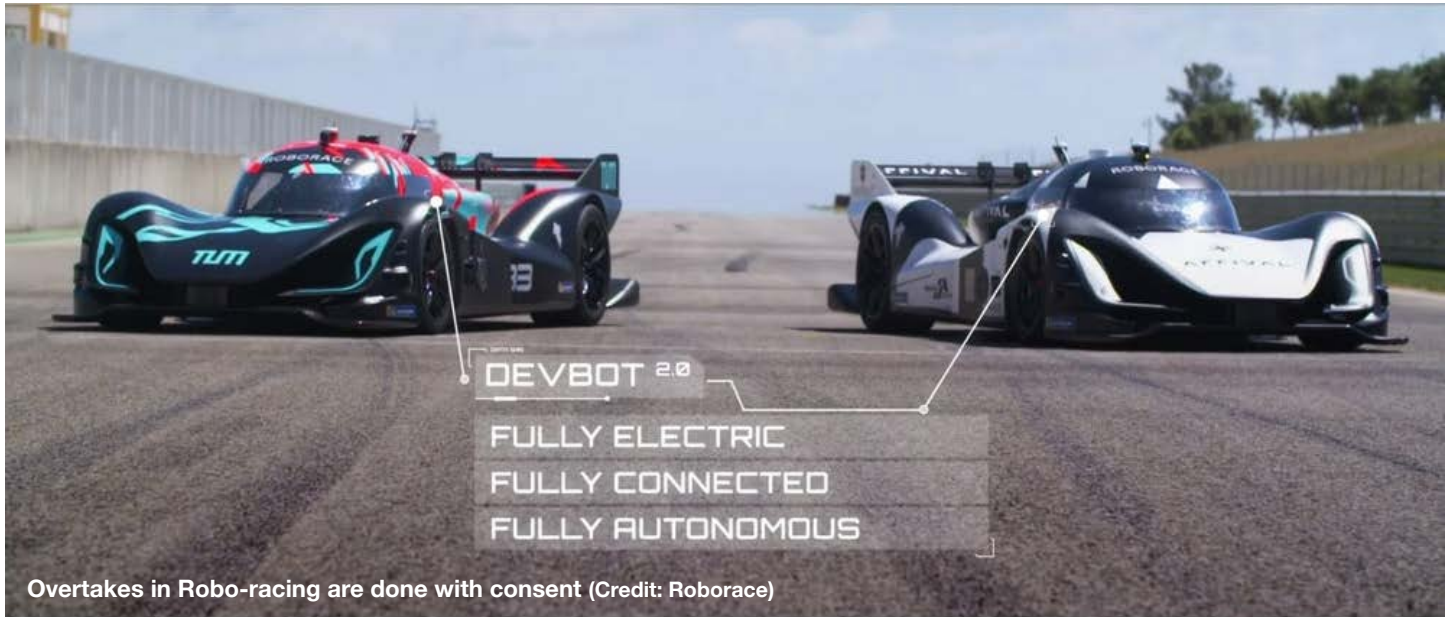
**9:00 - 10:00 am Pacific
12:00 - 1:00 pm Eastern**

<https://driveelectricweek.org/webinar.php>

Registration Is Required

<https://www.autoblog.com/2019/08/16/ford-rivian-electric-suv-truck-hackett/>

Humble Beginnings for Roborace: The World's First Autonomous Car Race is Run and Done



By Loz Blain

A little piece of history has gone down at the Monteblando racetrack in Spain, with the world's first fully autonomous car race completed last week. Two teams pitted code and cars against one another, with Team Arrival beating out the Technical University of Munich to take the first ever Roborace win.

The Robocars in question are no joke – 300-kW (402-hp) electric race machines capable of speeds over 320 km/h (199 mph) without drivers on board. Using five LIDARs, two radars, 18 ultrasonic sensors, GNSS satellite positioning, six cameras, two optical speed sensors and Nvidia Drive PX2 processing units, the cars drive themselves according to algorithms programmed by each race team.

The eight-lap race format is a bit weird. To cut down on crashes in these early pioneering days there's no overtaking outside the main straight, and overtaking is only achieved through mutual agreement. If a car is close enough to



Get close enough in the “trigger zone” before the main straight and you can request an overtake (Credit: Roborace)

the car in front in the “trigger zone” before the final turn, it requests an overtake from the car in front, which is required to move over and let it go past.

It's not what you'd call a great spectacle at this point. The cars go quick enough, but without the element of human risk, daring and otherworldly skill pushing the cars past their limits of traction, it's hard to say why anyone outside the autonomous development industry would tune in and watch. Indeed, you

could easily argue this kind of driverless racing could be developed much more cheaply the same way human racers are developed: on a go-kart track at lower speeds.

Either way, the money's been spent, the first race has been run, and you can see the “highlights” below. Congratulations to team Arrival and the Roborace series on their world first.

Source: Roborace

<https://newatlas.com/world-first-autonomous-car-race/60834/>

Colorado Adopts California Electric Vehicle Mandate



By Bengt Halvorson

For months, Colorado lawmakers and businesses have taken sides at a figurative continental divide—and not far from the real one—over whether (and how) the state might join California's Zero Emissions Vehicle program and its corresponding electric-car mandate.

We now have an answer. The Colorado Air Quality Control Commission has voted 8-1 in favor of a new standard requiring zero-emission vehicles (ZEVs).

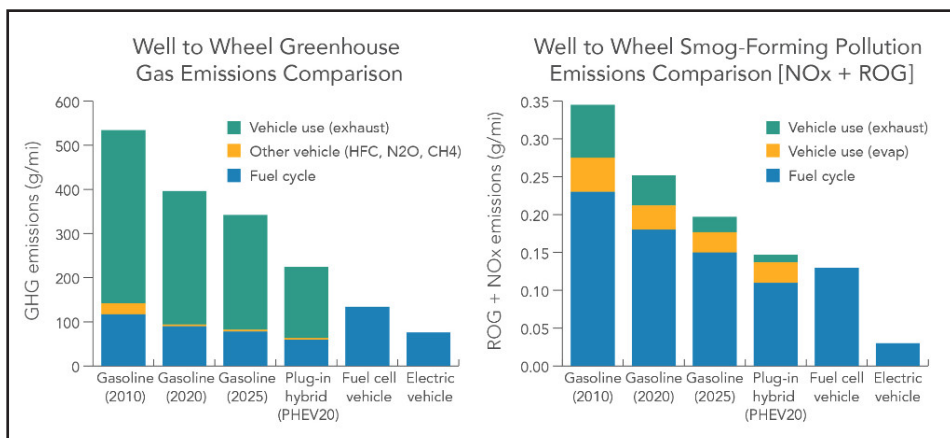
With the move, Colorado is one of 10 other states to observe California's ZEV standards, which include a mandate that a certain portion of EVs sold in the state be some combination of battery electric cars, plug-in hybrids, or potentially fuel-cell vehicles.

The other states observing the California rule include Oregon in the West, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Rhode Island, and Vermont in the East.

Under framework adopted Aug. 16, and worked out in conjunction with the Colorado Department of Public Health and Environment, Colorado will require that five percent of sellable inventory be ZEVs in 2023 and that moves up to six percent in 2025. The program allows some flexibility across model years and vehicle types, under the assurance from automakers it would mean more models available in the state.

The move isn't at all unexpected. Last November, Colorado moved to adopt California Low Emission Vehicle (LEV) standards, which, among other things, ramp up the standards on how long vehicle emissions equipment needs to last versus federal rules. Then in January, Colorado Governor Jared Polis directed state agencies to develop policies that would encourage EV adoption in the state.

continued next page



CARB ZEV program - greenhouse gas and smog-forming emissions

A report supported by the Environmental Defense Fund concluded that under a baseline scenario in which Colorado didn't adopt ZEV rules, annual sales of such vehicles would rise modestly to 8,594 in 2023 and 12,680 in 2030. But under the most ambitious scenario, in which it was assumed EV sales would also be growing nationally, numbers of 15,589 and 65,055 were projected. According to the Auto Alliance, there were 270,687 total vehicle sales in the state in 2017.

That and several other studies arrived at economic benefits (partly linked to public health) from the adoption of the rules. Under the adoption of the rules, the EDF report projected that emissions of nitrogen oxides, a precursor to smog—would be roughly halved across the vehicle fleet by 2050.

The Denver region is especially smog-prone and is the 12th most-polluted city in the nation, based on smog-forming pollutants, according to the American Lung Association.

The consumer advocacy organization *Consumer Reports* called the adoption of the program a smart move for saving money and reducing air pollution.

“Thanks to this decision, Coloradans can expect to be among the first to get access to electric vehicles, including



Chevrolet Bolt EV at ChargePoint station

electric pickups and SUVs, as they come to market in the coming years,” said Shannon Baker-Branstetter, CR’s manager of cars and energy policy.

Consumer Reports called the state’s approval “a win-win,” but noted that consumer education is an important hurdle. It found that 85 percent of prospective car shoppers in the state are unaware that it offers a \$5,000 incentive for consumers purchasing or leasing a new electric car [Ed: or plug-in hybrid].

Automakers, represented by the Alliance of Automobile Manufacturers, had been pushing for voluntary rules instead. In a June op-ed in the *Colorado*

Sun, the CEO and president Tim Jackson of the Colorado Automobile Dealers Association—one of the most vocal critics of the plan—claimed that it would place a financial penalty on those who don’t find plug-in vehicles meet their needs.

The new challenge for automakers is more of a logistical one. California and the nine states that had up until now gone with the ZEV mandate make up nearly 30 percent of the U.S. new-vehicle market. Adding Colorado to the mix nudges ZEV states close to a third of the market—all while the EPA could be poised to challenge California rules and further relax federal emissions and fuel economy rules.

https://www.greencarreports.com/news/1124616_colorado-adopts-california-electric-vehicle-mandate

Traffic backs up on Interstate 70 on Floyd Hill on Friday, Aug. 9, 2019. (Jesse Paul, *The Colorado Sun*)

[If you are interested to read about more details of the ZEV Mandate and what it will do, pros and cons; as well as what electric vehicles will be available in Colorado – click on the URL below.]

<https://coloradosun.com/2019/08/13/as-colorado-considers-an-electric-vehicle-mandate-heres-what-to-expect/>



Quiet Launch Daimler Builds First Electric Heavy-duty Semis for Fleet Test



Freightliner eCascadia electric semi

By Bengt Halvorson

Tesla might have been the first to generate a lot of fanfare over an all-electric Semi, but it's not the first to actually place an electric Semi with customers for full-time use.

That nod would go to Daimler Trucks North America. The initial two Freightliner eCascadia semis were built this week for its Electric Innovation Fleet—funded by a \$16 million California grant—and they'll be placed into duty later this month by the Southern California operations of two companies: Penske Truck Leasing and NFI.

The company's intent is to test how the trucks fare in large-scale fleet

conditions, and the innovation fleet "will inform the final production versions" of its two upcoming electric trucks, the eCascadia, and the medium-duty Freightliner eM2. Daimler also has an Electric Vehicle Council of 38 customers "to identify and address all potential hurdles to large-scale deployment of commercial battery electric vehicles."

How much range these trucks can achieve, while performing the tasks they're expected to—year round—has been one of the great challenges for development teams. Daimler has quoted a range figure of 250 miles from the eCascadia pack's 550 kwh of usable capacity (with an 80-percent charge

possible in about 90 minutes), while Tesla has stuck to claims of versions offering 300 and 500 miles.

With both trucks essentially fitting the spatial constraints, that led some in the industry to question the physics involved—including Martin Daum, the head of trucks at Daimler, who told Bloomberg that "for now, the same laws of physics apply in Germany and in California."

Tech luminary Bill Gates is among those with doubts about trucking going electric; he went so far as to say he doesn't see them working quite yet. But Daimler sounds bullish on electric.

continued next page



Daimler Trucks North America president and CEO Roger Nielsen



Freightliner eCascadia electric Freightliner



Freightliner eCascadia electric semi and Freightliner eM2 short-haul truck

“The road to emissions-free transportation is going to be driven with battery-electric vehicles,” said Daimler Trucks North America president and CEO Roger Nielsen, as part of the keynote address to the annual ACT fleet conference in April. “I believe the future is electric.”

At that time Daimler called natural gas “an interim solution,” and stated

that while it sees the potential for fuel cells it doesn’t see near-term viability. It stressed that three things need to happen: a common vehicle charging infrastructure; cheaper, lighter, and more powerful batteries; and incentives to strengthen electric’s ownership-cost advantages.

Those might not be the only eCascadias to soon be placed in duty. Daimler says

that it will put 50 commercial EVs into use by the end of the year in North America, and more deliveries of trucks from the Electric Innovation Fleet will continue through the year.

The longer-hauling electric truck gets its name from the Cascadia, which is the best-selling Class 8 heavy-duty truck.

Tesla has followed a different strategy than Daimler. It’s been getting the Semi out for customer test drives—including a long tour last year visiting big-name reservation-holders such as UPS and J.B. Hunt—but hasn’t yet placed it into fleet duty (outside of its own, in delivering cars). Tesla hasn’t recently provided a formal update on the Semi, but Green Car Reports has reached out to the company for comment.

The two trucks could actually reach the market within months of each other. The Tesla Semi is now expected for first deliveries in late 2020, while Daimler is targeting full-scale production in Portland, Oregon, beginning in 2021.



https://www.greencarreports.com/news/1124546_daimler-builds-first-electric-heavy-duty-semis-for-fleet-test

Tesla Pickup Truck To Cost Less Than \$50,000, 'Be Better Than F150', Says Elon Musk



By Fred Lambert

Elon Musk made interesting new comments about the upcoming Tesla Pickup truck, including a first hint at the starting price, which he aims to keep under \$50,000, and some of the functionality.

Tesla's CEO has previously sought suggestions for features to add to the Tesla truck under development and he revealed some planned features, like an option for 400 to 500 miles of range, Dual Motor All-wheel-drive powertrain with dynamic suspension, as well as '300,000 lbs of towing capacity'.

During an appearance on Ride the Lighting podcast this weekend, Musk made some new comments about the upcoming electric pickup truck.

He confirmed that Tesla is aiming to keep the starting price under \$50,000: *"We don't want it to be really expensive. I think it got to start at less than \$50,000 – it's got to be like \$49,000 starting price max. Ideally less. It just can't be*

unaffordable. It's got to be something that's affordable. There will be versions of the truck that will be more expensive, but you've got to be able to get a really great truck for \$49,000 or less."

Based on previous comments, it sounds like the design of the Tesla pickup truck is going to be quite special.

Musk added about the design during the podcast:

"It's got to have incredible functionality from a load carrying standpoint, look

amazing – but it won't look like a normal truck. It's going to look pretty sci-fi. That means that it's not going to be for everyone- like if somebody just wants to have a truck that looks like trucks have looked like for the last 20 to 40 years, it's probably isn't for them."

He confirmed that the cryptic teaser image released earlier this year was actually the front of the Tesla pickup truck: [See photo below]

continued next page



People have been trying to interpret the image ever since it was released at the launch of the Model Y and it resulted in many interesting theories.

We gathered some of the renderings that came out of it.

The CEO reiterated that it's going to be a "Blade Runner-like" truck design – something he has been saying for a while now, but it's hard to know exactly what he means.

He anticipates that some people will think that "it doesn't look like a truck." Musk compared the disruptive design to the transition between the horse and carriage and the automobile."

As for the capabilities of the Tesla pickup truck, the CEO is aiming for high standards:

"It's going to be a truck that is more capable than other trucks. The goal is to be a better truck than a [Ford] F-150

in terms of truck-like functionality and be a better sports car than a standard [Porsche] 911. That's the aspiration."

Ford recently confirmed that they plan to electrify the F150 pickup truck and they also invested in the electric truck startup Rivian and partnered with them to make another electric vehicle.

Earlier this year, Musk said that Tesla plans to unveil its electric pickup truck around this summer.

Electrek's Take

Some interesting new comments here.

I am sure that the \$50,000 base version can be a good electric truck, but I imagine that most of the incredible capabilities that they initially teased, like the 400+ range, etc. are going to be reserved for much more expensive versions of the Tesla pickup truck.

Yet, the base version should signifi-

cantly undercut the base price of the Rivian R1T, which starts at \$69,000 with a range of "230+ miles."

If Tesla can achieve the same range for that price point, they would have something extremely interesting in the segment.

As for the design, I think I am starting to have a much better idea now that Elon says that people might think "it doesn't look like a truck."

They are probably going for a much more aerodynamic design, which is, of course, unconventional for a pickup truck.

I can't wait to see what that looks like.

Featured Image: Tesla Pickup Truck imagined by Turkey-based car designer Emre Husmen.

[Video also available in this article.]

<https://electrek.co/2019/06/02/tesla-pickup-truck-price-f150-elon-musk/>

Update: Tesla Pickup Truck

[Following is an excerpt of the update – after 33 stories about the Tesla Pickup.]

By Fred Lambert

CEO Elon Musk has been talking about Tesla making an all-electric pickup truck for years now, but he said that third generation vehicles, the Model 3 and Model Y, were the priority for now. When revealing his 'Master Plan Part Deux', Musk confirmed that Tesla has been working on a pickup truck but that the company is still in the 'early stages of development'.

Nonetheless, he later added that we should expect an unveiling of the concept in "6 to 9 months", which should end up being in early to mid-2017. It is expected to be in production



within the next 3 to 4 years (2019-2020). Not much is known about the vehicle at this point and we are stuck with only unofficial renderings from artists, like the one above, to help us envision what a Tesla pickup truck could look like.

Additionally, Musk did say that Tesla will likely build an all-electric cargo van on the chassis that it is developing for its pickup truck.

<https://electrek.co/guides/tesla-pickup-truck/>

World's Largest EV Never Has to Be Recharged

By Eric C. Evarts

A quarry in Biel, Switzerland, is operating the world's largest electric vehicle, a 110-ton dump truck, to haul lime and marl off the side of a mountain to a cement factory. Perhaps best of all, it consumes *no* energy doing it. [Ed. Ahem! Well, that's not quite factual!]

How is that possible, you ask?

The dump truck, at 45 tons, ascends the 13-percent grade and takes on 65 tons of ore. With more than double the weight going back down the hill, the beast's regenerative braking system recaptures more than enough energy to refill the charge the eDumper used going up.

The Elektro Dumper—eDumper for short—made by Kuhn Schweiz, is based on a Komatsu HB 605-7: 30 feet long, 14 feet wide, and 14 feet tall. The tires are six feet high, and the dump bed reaches to more than 28 feet, fully raised.

Kuhn Schweiz adds a 600 kilowatt-hour battery pack—big enough for six, long-range Tesla Model S'es—from Lithium Storage that weighs 9,000 pounds.

CNN recently brought Formula 1 driver Lucas DiGrassi along to test drive the machine, owned by Swiss cement company Ciments Vigier SA. He reported starting with a 90 percent charge at the bottom and reaching the top of the grade with 80 percent, then recovering battery charge to 88 percent on the way down (not unlike our writer's experience with a Chevrolet Bolt EV in the Rockies.)

Marking that trip around 20 times a day, Kuhn Schweiz says the eDumper produces 200 kwh of surplus energy every day, or 77 megawatt-hours a year. A typical dump truck uses between 11,000 and 22,000 gallons of diesel fuel a year. That saves up to 196 metric tons of global-warming carbon-dioxide gas a year.

All photos: Kuhn Schweiz Elektro Dumper electric mining truck
©eMining AG

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Mercedes-Benz EQC Received A Lot of Praise From Fully Charged's Robert Llewellyn

By Mark Kane

The most recent episode of *Fully Charged* is about the upcoming Mercedes-Benz EQC 400, which quickly gained Robert Llewellyn's attention.

A few hours with the car in Norway revealed it's a very interesting all-electric SUV, with exceptional comfort, full of tech features and gadgets and also maybe the quietest (or at least one of the quietest) BEVs so far.

The human-machine interface is excellent, so the driver can quickly get used to all of the features, although you better watch out with the "Mercedes" word as it will wake up the assistant.

"For this Fully Charged car review, Robert Llewellyn gets in a Mercedes-Benz EQC 400 4matic (a zero tailpipe emission SUV) full of doubt. Five minutes later he's in love."

Preliminary energy consumption numbers of 24 kWh per 100 km (62 miles) or 2.59 miles (4.17 km) per kWh indicate that it will be a relatively efficient BEV (between Tesla and Audi e-tron/Jaguar I-PACE, we guess).

One of the greatest features implemented in the EQC is the charging software, which eliminates the necessity to use apps or cards — all you do need is to connect (to tens of thousands of compatible charging points) and charging starts automatically. This feature is coming to other models and brands in Europe and North America.

Mercedes-Benz EQC 400 specs:

- range of 417 km (259 miles) (WLTP)



- range of 445-471 km (277-293 miles) (NEDC)
- energy consumption at 20.8 - 19.7 kWh/100 km (NEDC)
- 80 kWh battery pack (384 cells)
- battery pack weight of 625 kg
- 0-100 km/h (62 mph) in 5.1 seconds
- top speed of 180 km/h (112 mph)
- dual motor all-wheel drive (two asynchronous motors)
- system output 300 kW (408 HP) and 760 Nm of torque
- AC charging takes 11 hours (7.4 kW single-phase on-board charger)
- DC fast charging takes around 40 minutes (10-80% SOC)
- Length/width (incl. mirrors)/height: 4,761/1,884 (2,096) /1,623 mm
- Kerb weight (EC)/perm. GVW/payload (EC): 2,495/2,940/445 kg
- Luggage compartment (depending on equipment fitted): approx. 500 l

[Selling early in 2020 starting at \$70,000.

This article has a very good video of the test drive by Llewellyn as well as a gallery of photos].

<https://www.youtube.com/watch?v=5JTew1D5Tk8>



<https://insideevs.com/reviews/360608/fully-charged-test-mercedes-benz-eqc/>

Full-Width Digital Dashboard Revealed for the Honda E Compact EV



Five neatly integrated high-resolution color screens occupy the entire width of the Honda e's dash (Credit: Honda Motor Co., Ltd)

By Matt Kennedy

Honda has been drip-feeding details on its forthcoming Honda e electric hatchback for a while now. We've learned about the radical camera-based side mirrors and the "skateboard" chassis, and now Honda has revealed details of the stylish – yet almost domestic looking – panoramic digital dash.

If you're thinking of registering your interest in this elegant little urban EV, perhaps you should ask if it comes with a handy pocket for screen-wipes, because with a full-width dash made up of five high-resolution color screens, you may find yourself removing a lot of

fingerprints. Furthermore, how many people are going to be tempted to put their coffee on that near-flat dashboard?

The screens at the extreme left and right of the dash are for the Side Camera Mirror System, which might not be legal yet where you live, but is designed to aid safety and aerodynamics. Imagine never again having to look through a rain-soaked window into an equally hazy external side mirror.

The traditional driver's console is replaced with an 8.8-inch TFT instrument display showing speed, power, charge status, drive mode and all

the usual safety features and warnings you'd expect. Nothing particularly new here, but in the context of the full-width experience it's pretty cool.



In the middle – well, slightly to the right – of this quintet of screens sits two 12.3-inch LCD touchscreens, which take up the bulk of the dash area. This

continued next page

HONDA E



The two central screens are incredibly customizable – even down to a choice of wallpaper to personalize your dash. While the dual 12.3-inch LCD touchscreens can interact, each also functions as a separate display to suit driver and passenger. We all have wallpaper for our smartphone screens, so why not for our car dashes? A full suite of entertainment options are built in to the dash system, as well as customization options for the operation of the car itself. (Credit: Honda Motor Co.,Ltd)

is where the real magic happens and the interface will be second nature to anyone familiar with smart phones as it features both touch and swipe controls with customizable apps. You can even swipe information from one screen to the other. For example, your passenger might be looking up the best way to get to a restaurant. Once the navigation is set, they can swipe that from the right-hand screen to the one closer to your line-of-sight.



All of the Honda e's settings can be independently controlled from either of these screens and custom on-screen shortcut buttons can be created for each display.

Of course, the system integrates with any smartphone and offers further integration via Apple CarPlay or Android Auto. Speaking of smartphones, you can also lock and unlock the Honda e via its smartphone app, which will also alert the driver if the car moves beyond a predetermined geofenced area.

Honda has also designed its own voice assistant system for the EV, complete with a little helper icon reminiscent of Microsoft's old paperclip assistant – and hopefully less annoying. Activated by the command, "OK Honda," the

assistant employs machine learning to tune itself to the user's voices over time. The Honda e also offers a Wi-Fi hotspot that is available when the car is parked, but it's unclear whether this requires its own data plan with a third party or if it piggybacks off the driver's smartphone.

"Our objective for the Honda e was that the simple exterior style continues inside. The overall interior atmosphere combined with exceptional comfort by using familiar materials such as wood grain and textured fabric, is reminiscent of a modern living room," says Kohei Hitomi, Large Project Leader, Honda e. "In this modern, relaxing environment, occupants can effortlessly engage with advanced connected technology such as the camera mirror system and dual touchscreen display that is highly

sophisticated, but incredibly easy to use."

To date, Honda has had 36,000 expressions of interest from potential customers in the EU for the e, and the production version should be unveiled later this year. Priority ordering is already available to customers in the UK, Germany, France and Norway. Everyone else should keep a keen eye on their local Honda websites.

A video showing off the unique screen-based dash can be seen at the bottom of the article.



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<https://newatlas.com/honda-e-reveals-full-width-panoramic-screen-based-dash/60773/>

Confirmed: BMW i3 and i8 Won't Get Direct Successors



The BMW Vision M Next Concept is The Way to Go

By: Jacob Oliva

Some say that the BMW i3 and i8 are quintessential battery-powered cars from the Bavarian brand. But both models are aging and quite frankly, with several more modern names that offer better performance and range, both 'i' models are due for an update really soon.

BMW seemed to have an answer for that a few weeks ago with the Vision M Next Concept at Munich, Germany. With its wedge shape and design cues shared with the i8, it's like a sneak peek into the next-generation i8. We certainly hoped for it, too, but we're wrong.

According to BMW's director of development Klaus Frölich, the Vision M Next Concept isn't going to be the successor of the i8 production coupe.

In fact, the i3 and i8 won't get any successors at all.

"M is fast and furious and fun and that always works, but there is no direct successor for the i3 and no direct successor for the i8," said Frölich in a report by Australia's CarSales.com.au

Frölich also mentioned that the pure i cars are one-offs, which means they are specifically made for a purpose, and not as a line of cars.

As for the Vision M Next Concept, Frölich has confirmed that it will enter *continued next page*

On the Bright Side, the Vision M Next Concept is Heading Towards Production



DEVELOPING A CONCEPT

production within three years. Even better, the BMW honcho sees it as a hybrid sports car that performs like an M car – and to behave like one, the weight should be controlled, which is too challenging in a pure EV. However, he didn't rule out the possibility of a pure-electric M car, but it won't be in the near future.

Frölich added that the target maximum weight for the Vision M Next is 3,748 pounds (1,700 kilograms). The concept vehicle in Munich, however, was well beneath that number.



<https://www.motor1.com/news/357442/bmw-i3-i8-killed/>

This Plane Can Fly 500 Miles, Powered Entirely By Hydrogen

It's the largest zero-emissions plane to ever fly without any fossil fuels.



Photos: courtesy ZeroAvia

By Adele Peters

A few months ago, a small six-seater plane soared over fields near Hollister, CA. From the outside, it looked entirely normal. But instead of running on jet fuel, it was being powered by technology that can be run on hydrogen (though this flight was powered by electric batteries). It was the largest zero-emissions plane to ever fly without support from fossil fuels.

ZeroAvia, the startup that designed the hydrogen-fueled electric powertrain inside the plane, has been testing the technology over the past year and emerged from stealth today. The company says it will run a full test flight with hydrogen on board in a few weeks. In 2022, it plans to begin supplying the powertrain for use in planes with as many as 20 seats, on flights up to 500 miles long.

Several other startups are also working



on technology designed to cut emissions from air travel, an industry responsible for nearly 900 million metric tons of CO₂ emissions a year at a time when emissions need to begin to shrink to zero. But most other companies rely on batteries to store electric power. (Ampaire, a startup that recently took its first public flight, retrofits existing planes with hybrid-electric systems; Eviation, another startup, is designing

100% battery-electric planes.) ZeroAvia saw advantages in using hydrogen. “For the foreseeable future, actually getting a sizable aircraft in the air for a reasonable amount of time will be quite difficult with batteries,” says **Val Miftakhov, founder and CEO of the company, who previously founded eMotorWerks, an electric car charging company that was acquired two**

continued next page

years ago. A system based on hydrogen fuel cells is around four times as energy dense as the best batteries currently available, he says.

For airlines, switching to hydrogen-fueled airplanes for short flights would save money. ZeroAvia estimates that the total cost of operation will be around half that of flying conventional planes because of savings on fuel costs, more efficiency, and less maintenance. The company also believes that the tech will also be cheaper to use than battery-electric planes, in most cases, because high-density batteries have to frequently be replaced.

Farther in the future, hydrogen tech could be used for long-haul flights. From a technical standpoint, it would be feasible now with liquid hydrogen storage. “Fundamentally, there are no physical constraints on the hydrogen power train that don’t allow it to be used in a large aircraft for long distances,” says Miftakhov. But using liquid hydrogen would require more work in safety testing and certification; for now, the company is using compressed hydrogen stored in carbon fiber cylinders, similar to cars that are already on the road like the Toyota Mirai. The cylinders make the planes a little heavier, meaning they can’t travel as far. But nearly half of global flights are 500 miles or less, Miftakhov says,



within the range of its initial technology.

Planes equipped with the new technology can begin to connect smaller regional airports that aren’t often used now, which could have advantages for travelers. “Your wait times are shorter,” he says. “Your security lines are shorter or nonexistent in the smaller airports, and that contributes to the better experience as well. So as the industry sees this sort of benefit and momentum, then we expect a significant part of the short-haul traffic that today happens between the mega hubs will go into this model.”

The company is already in talks with several airlines, he says. The technology could see early adoption in places like Norway, where the government plans to move to 100% zero-emissions flights by 2040, but the whole industry

is moving toward solutions to reduce emissions. The industry aims to cut emissions in half by 2050 compared to 2005. The best science suggests that global emissions from all industries need to drop further, to net zero by the middle of the century. “It really is a great time to be in this right now and be able to offer something realistic,” says Miftakhov.

Correction: *This article has been updated to reflect the fact that the test flight mentioned used only the powertrain that is designed to be powered by hydrogen, but on this flight it was powered by batteries. While the hydrogen fuel has been tested successfully on the ground, a plane has not yet flown with hydrogen fuel aboard the plane, though that test flight will happen soon. We regret the error.*

<https://www.fastcompany.com/90388931/this-plane-can-fly-500-miles-powered-entirely-by-hydrogen>

Latest eVTOL news

Electric Aircraft Symposium 2019 Synopsis

In Wisconsin in July, the other EAA hosted two dozen of the world’s leading electric aircraft developers and technology experts spoke at EAS 2019, all of which are available for free viewing in 26 videos on the VFS YouTube Channel.

Don’t have time to watch all the videos? Go to the URL below for a summary of the key points for each speaker, under the link to each video.

<http://evtol.news/2019/08/14/electric-aircraft-symposium-2019-synopsis/>



HET Electric Motor Massively Boosts Power, Torque and Efficiency, Reduces Weight and Complexity

By Loz Blain

A Texas-based startup has raised US\$4.5 million in seed funding to develop and commercialize a remarkable electric motor technology. The father/son team claims the design can massively reduce the size and complexity of electric powertrains while also significantly boosting efficiency and doubling the torque output.

Electric cars are stunning performers off the line. In sprint tests they routinely humble high-performance combustion-engined cars many times more expensive than them. But in order to achieve this massive startup torque out of small-diameter, easily packaged motors, most of them use gearboxes. Not multi-speed gearboxes like you'd use with a combustion engine, but single-speed reduction boxes designed to let electric motors spin at high, efficient RPM while the wheels spin slower.

These gearboxes are heavy, complex and expensive – and potentially unnecessary, according to a Texan father-and-son team that claim they've invented a new type of electric motor that can radically simplify the electric powertrain while delivering big efficiency, torque, power and range bonuses.

Linear Labs completed a seed round of financing in April this year, bringing in US\$4.5 million to develop its key IP: the Hunstable Electric Turbine (HET), Hunstable being the surname of its two founders, CEO Brad and his father and CTO Fred.



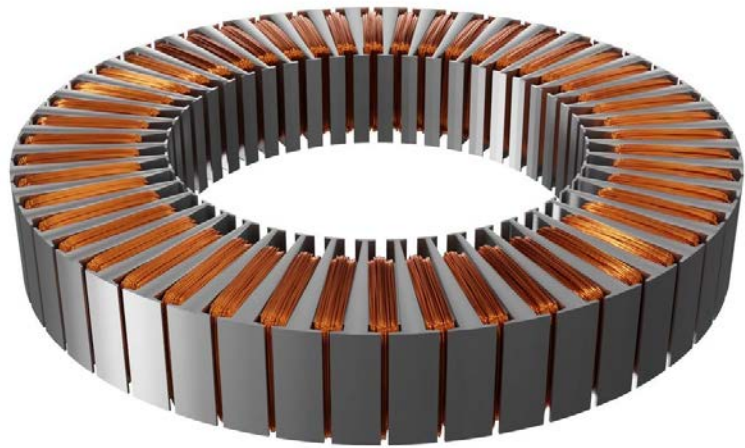
Linear Labs makes some enormous claims about its innovative electric motor design: two to five times the torque, three times the power, 20 percent greater efficiency, less complex powertrains, no gearbox required (Credit: Linear Labs)



Linear Labs expect to debut the HET motor in a scooter in 2020, followed by a car prototype in 2021 (Credit: Linear Labs)

continued next page

The HET is a three-dimensional, circumferential flux, exterior permanent magnet electric motor with some interesting characteristics. For starters, it runs four rotors where other motors typically run one or two. The stator is fully encapsulated in a four-sided “magnetic torque tunnel,” each side having the same polarity, ensuring that all magnetic fields are in the direction of motion, and there are no unused ends on the copper coils wasting energy. All magnetism the system creates is thus used to create motion, and all four sides of the stator contribute torque to the output.



The stator is encased in a “magnetic torque tunnel” (Credit: Linear Labs)

It also achieves field weakening in a unique way. Field weakening is used to increase motor RPM when it’s already running at full voltage, by reducing the field flux – which is usually achieved by injecting extra current in an opposing direction. This current injection trades additional speed for motor torque, and reduces the efficiency of the motor. The HET achieves field weakening by rotating one or both of its magnetic end plates out of alignment, meaning that this motor can build extra speed with no efficiency loss. Indeed, overall efficiency climbs at higher speeds.

Where most motors suffer from torque pulsing, or cogging, at slow speeds, which could make an electric car take off in a jerky manner, the HET is able to produce overlapping power pulses around the stator for enormous, smooth torque at slow speeds, and then change its operating patterns by grouping poles together as motor speeds increase. This almost acts like an electronic transmission, emulating six-phase, three-phase, two-phase or one-phase designs and allowing the motor to increase speed without changing its frequency, voltage or current levels.

The result, says Linear Labs, is a truly

remarkable motor that produces two to five times the torque density, at least three times the power density and at least twice the total output of any permanent magnet motor of the same size.

It also eliminates the need for DC/DC converters and the aforementioned gearboxes, reducing total vehicle cost and weight significantly, and the company says the motor’s inherent efficiencies across different speeds, as well as the weight savings it achieves through component reduction, can draw some 10-20 percent more range out of a given battery pack.

It doesn’t cost any more to manufacture than a traditional motor design, or require any specialized tooling – and it can be built without using rare earth metals if necessary. It’s easy to cool, at least the stator is, because you can run liquid cooling inside the copper coils.

These are, of course, enormous claims. And while Linear Labs quickly backs them up with quotes from independent experts, there’s a long path between disruptive idea and world-changing commercialization. The company says it’s looking to implement the motor in a scooter prototype next year, and a

car prototype in 2021. The company sees further potential for the motors in multirotors, flying cars, wind power generation and HVAC.

It’s also worth noting that the company is comparing its tech to “current market leading top performing permanent magnet” motors when it states the figures above – probably not the highly secretive new permanent magnet-enhanced synchronous reluctance motors that Tesla designed in-house for the Model 3, and has been rolling out on the Model S. Placing one of these in the front of the Model S, and leaving a regular induction motor at the rear gives Tesla one motor optimized for power and torque, and the other for efficiency and range, and in normal driving, this added up to an impressive 10-percent range figure boost for the car as a system.

So while Linear Labs has achieved some terrific test results, and raised the capital to take things further, it remains to be seen how it’ll work in practice. We wish this small company all the best as it works to take HET tech to the commercial level.

Check out the Hunstable Electric Turbine in the video in the article.


Don't Miss These...

From time to time there are articles and videos we would like to bring to your attention but are not able to reproduce in this newsletter. The Electric Vehicle is continuing to be newsworthy on many different levels so when we find interesting items we will share them with you.

Videos of Interest

2020 Polestar 2 EV Walkaround – Better Than the Tesla Model 3? | What Car?



Readers may remember with sadness the demise of the Volvo brand several years ago, when it was sold to Geely in China. Here is the first BEV product from that firm, described in detail at a Shoreditch London showing. With many fine-grain features revealed the level of attention to detail is apparent. This car will be an interesting entry and hopefully will make it to the American market soon, taking several cues from Tesla products. With an Android running the infotainment systems, this has promise for future customization. Just how that would be handled with sales / service is, at present, unknown. It's an interesting piece of pre-release promotion for them. At 55,000 UK pounds (\$66.8K USD), with a less expensive promised a year later, this model will become available in 2020. 

<https://www.youtube.com/watch?v=jjeNoPJ25Jc>

The 2020 Drako GTE Is a 1,200-Hp, All-Electric Hyper-Handling Supercar Debuts at Monterey Auto Week and Pebble Beach Concours D'Elegance



Startup firm Drako Motors unveils its \$1.25 million four-seater

At the Quail, a Motorsports Gathering during Monterey Car Week 2019, upstart Drako Motors unveiled its striking new all-electric supercar, the GTE. Whatever your feelings regarding its exterior styling, it boasts several attention-grabbing numbers: 1,200 combined horsepower, a 206-mph top speed, and a base price in excess of \$1 million. If you are interested read about it here: 

<https://www.automobilemag.com/news/2020-drako-gte-electric-ev-supercar-specs-photos/>

Don't Miss These ...(cont.)

Audi e-tron Crash Test, Supercharging Free for New Model S, Model X, Model 3 implant— TEN 261



This TEN episode covers a wide range of topics ranging from Audi's e-tron successful crash testing, to upcoming info from Mercedes on their upcoming Frankfurt Auto Show displays next month, to unlimited free supercharging again for Tesla models, and BMW's pilot inductive charging coming to California, etc.

This headline-packed quick (15 minute) skim of the many topics underscores the activity in the field of electromobility. She provides links to many of this topics for additional depth.

https://www.youtube.com/watch?v=23B1daqU_uE



Ad Industry Professional Reacts To Electric Car Ad Fails!



People often complain that they never see decent ads for electric vehicles, either on TV or the radio, print and on the Internet. But the reality is that there have been some electric car ads to date. Some are reasonably good, others are pretty terrible.

Here is ad industry expert Matt Teske (who happens to be the brains behind the Chevrolet Jolt spoof ad and Charge-way.net) to look at just some of the electric and plug-in hybrid car ads we've seen to date and ask one basic question: Just how good (or bad) are they? This is a snicker our readers can enjoy!

<https://youtu.be/H0hEDg9Lx6g>



Normal People Drive Electric

Electrify America who is building CCS charging infrastructure with VW Dieselgate funding has produced this interesting website. Take a look and tell us what you think!

<https://www.normalnow.com/#Welcome>



Don't Miss These ...(cont.)

Japan's Nec Shows 'Flying Car' Hovering Steadily For Minute



Japanese electronics maker NEC Corp. recently showed a “flying car,” a large drone-like machine with four propellers that hovered steadily for about a minute. The test flight reaching 3 meters (10 feet) high was held in a gigantic cage, as a safety precaution, at an NEC facility in a Tokyo suburb. The preparations such as the repeated checks on the machine and warnings to reporters to wear helmets took up more time than the two brief demonstrations. The Japanese government is behind flying cars, with the goal of having people zipping around in them by the 2030s.

https://www.youtube.com/watch?time_continue=59&v=cmdilp9LM0E

2020 Volkswagen ID 3 driven | Will VW's EV change the world? | Autocar



With the muscle of the world's largest car-maker behind it, the Volkswagen ID3 could be the biggest thing to happen to the electric car yet. Based on an all-new model platform dedicated to electric cars, the ID3 will be available with a choice of three battery packs, the largest of which should give it range of almost 350 miles. It won't be on sale in the UK until spring 2020, but Matt Saunders went to VW's headquarters in Wolfsburg to drive a prototype.

<https://www.youtube.com/watch?v=A8cHHNPRg-c&feature=youtu.be>

VW ID.R - The fastest car at Goodwood Festival of Speed | Fully Charged



Everybody is raving about Tesla! This video makes the point the VW's ID.R platform is no slouch and when they release their products in the next two years, there will be competition for Tesla. As shown here, in West Sussex England course – oldsters are in disbelief as yet another electric crown is awarded. VW has the race car that recently claimed a new Nurburgring record, their Pike Peak International Hill Climb win and now this special challenge as well, as piloted by Roman Dumas. A McLaren F1 has held the record for 20 years. They do configuration changes. The basic pack details are revealed with surprising specs! Host Johnny Smith also provides several glimpses of some upcoming models – discussing the ID Buzz bus, and other small cars. Also views of the Honda EV.

<https://www.youtube.com/watch?v=stzSQkRu7DU>

Is a Tesla Powerwall 2 Worth the Money?



Ben Sullins discusses the decision to include a Tesla Powerwall2 at his San Diego home. Some of the things he discusses have surely run thru the heads of our readers in dream about their energy future. A clear depiction of the displays of the Tesla App which are remarkably similar to those of the popular Sense.com app, essential for whole-house energy consumption monitoring.

<https://youtu.be/Eh6gqPI51pU>

Don't Miss These ...(cont.)

Richard Montgomery High School EV Show



Russell Corbin was raised near the Chesapeake Bay in Silver Spring, Maryland, and attended the International Baccalaureate program at Richard Montgomery High School.

In his own words: “This year I’m excited to begin my liberal arts higher education at Pomona College in Claremont, California. Inspired by my passions for cars, nature, and my desire for a liveable future planet, I’ve dedicated much of my time to advocating for sustainable transportation. Among many things, I’ve focused on advocating for electric school buses, and I enjoy talking to folks about my electric driving experience at electric vehicle events. Otherwise I love hiking, sailing, and playing badminton! My future career remains a question mark, but I know I will be doing something to contribute to fighting the environmental crisis.”

Russell has received the Plug In America Student award [page 11]. He is honored to receive this award, and glad to be a part of the electric revolution! https://youtu.be/C48PCC8_LnQ

Inside the Largest Independent Tesla Repair Facility Part1: Gruber Motors



https://www.youtube.com/watch?v=V_kkClyTUmc&feature=youtu.be This is part 1

Tesla Roadster | Everything you've wanted to know (technical), Part 2: Gruber Motors



https://youtu.be/_w9vB8V8mII Part 2 covering the Roadster internals.

Excellent news to report! An independent (non-factory) repair facility for Tesla Gen 1 Roadsters, the models S, X and 3 has produced promotional videos on what they do and how they approach things! Now there is hope for a bricked Roadster, or an otherwise neglected expensive EV. Based in Phoenix, AZ, the enterprising owner is doing what most other repair facilities don't understand. Note: Worldwide, taking your ICE to a mechanic for electrical problems can be an exercise in futility, especially if the “shotgun approach” is used. (That is replacing module after module until the problem goes away.) In modern ICE cars built after about 1993 there can be many computers inside, making version compatibility a major issue. This firm approaches things differently, getting back to basics.)

We wish them luck and hope others resources spring up elsewhere as well. It is always instructive to learn about the details of these revolutionary vehicles at a deep technical level.



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Electric Auto Association (EAA) is *the* oldest and largest electric vehicle non-profit. EAA has a network of chapters across the United States and the globe. Our members promote and support electric vehicle acquisition and ownership to create a better future.

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"Current EVents" Personal Listing, "Electric Car Insider Guide"

EAA Polo Shirt, "Current EVents", Supercharged Personal or
Business Supporter listing (one issue)

EAA Polo Shirt, "Current EVents" , Supercharged plus Personal or
Business Supporter listing two issues)

Polo Shirt, "Current EVents" listing as a High Voltage Personal or
Business Supporter (three issues), "Who Killed the Electric Car?"
movie

Electric Auto Association is a 501 3(c) non-profit organization.

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www.electrcauto.org



Keep Up on all Auto Shows & EV Related Conferences

US and International Events

National Drive Electric Week (NDEW) is Sept 14-22. See <https://driveelectricweek.org/>

PEBBLE BEACH CONCOURS D' ELEGANCE 08/18/19 - 08/18/19

SALON PRIVE
PUBLIC DATES: 09/05/19 - 09/08/19

MOTOR TREND INTERNATIONAL AUTO SHOW - LAS VEGAS
09/13/19 - 09/15/19

OKLAHOMA STATE FAIR AUTO SHOW
09/12/19 - 09/22/19

FRANKFURT INTERNATIONAL MOTOR SHOW 09/12/19 - 09/22/19

CENTRAL FLORIDA INTERNATIONAL AUTO SHOW 09/20/19 - 09/22/19

STATE FAIR OF TEXAS AUTO SHOW
PUBLIC DATES: 09/27/19 - 10/20/19

ORANGE COUNTY INTERNATIONAL AUTO SHOW 10/03/19 - 10/06/19

MEMPHIS INTERNATIONAL AUTO SHOW
10/04/19 - 10/06/19

SACRAMENTO INTERNATIONAL AUTO SHOW 10/18/19 - 10/20/19

NASHVILLE INTERNATIONAL AUTO SHOW 10/18/19 - 10/20/19

TOKYO MOTOR SHOW
10/24/19 - 11/04/19

SEMA PUBLIC DATES: N/A
EDMUNDS.COM COVERAGE DATES:
11/05/19 - 11/08/19

DUBAI INTERNATIONAL MOTOR SHOW
11/14/19 - 11/18/19

CENTRAL CALIFORNIA AUTO SHOW
11/15/19 - 11/17/19

TAMPA BAY INTERNATIONAL AUTO SHOW 11/15/19 - 11/17/19

EDMUNDS.COM COVERAGE DATES:
11/18/19 - 11/21/19

CHARLOTTE INTERNATIONAL AUTO SHOW 11/21/19 - 11/24/19

ARIZONA INTERNATIONAL AUTO SHOW
11/28/19 - 12/01/19

SAN FRANCISCO INTERNATIONAL AUTO SHOW 11/28/19 - 12/02/19

LOS ANGELES AUTO SHOW
11/22/19 - 12/01/19

INDIANAPOLIS AUTO SHOW
12/26/19 - 01/01/20

HAMPTON ROADS INTERNATIONAL AUTO SHOW 01/10/20 - 01/12/20

SOUTH CAROLINA INTERNATIONAL AUTO SHOW 01/10/20 - 01/12/20

MONTREAL INTERNATIONAL AUTO SHOW 01/17/20 - 01/26/20

UTAH INTERNATIONAL AUTO EXPO
01/17/20 - 01/20/20

WEST VIRGINIA INTERNATIONAL AUTO SHOW 01/17/20 - 01/19/20

HOUSTON AUTO SHOW
01/22/20 - 01/26/20

ST. LOUIS AUTO SHOW
01/24/20 - 01/27/20

CINCINNATI AUTO EXPO
02/05/20 - 02/09/20

QUAD CITY REGIONAL AUTO SHOW
02/07/20 - 02/09/20

CHICAGO AUTO SHOW
02/08/20 - 02/17/20

NORTH CAROLINA INTERNATIONAL AUTO EXPO 02/13/20 - 02/16/20

VIRGINIA INTERNATIONAL AUTO SHOW
PUBLIC DATES: 02/14/20 - 02/16/20

CANADIAN INTERNATIONAL AUTO SHOW 02/14/20 - 02/23/20

PORTLAND INTERNATIONAL AUTO SHOW 02/20/20 - 02/23/20

GREATER MILWAUKEE AUTO SHOW
02/22/20 - 03/01/20

THE WORK TRUCK SHOW
03/03/20 - 03/06/20

GENEVA MOTOR SHOW
03/05/20 - 03/15/20

AMELIA ISLAND CONCOURS D'ELEGANCE 03/12/20 - 03/15/20

ZAGREB AUTO SHOW
PUBLIC DATES: 03/31/20 - 04/05/20



International CANADA

EV COUNCIL OF OTTAWA

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VANCOUVER EVA

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MEXICO

EVA of SONORA (AVES)

Web Site: Diadelautoelectrico.org
Contact: Oscar Vidal
662-105-6551

TAIWAN

TEVA | Taiwan Electric Vehicles Association

Facebook: www.facebook.com/TaiwanElectricVehiclesAssociation
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United States

NEDRA National Electric Drag Racing Association

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CHICO EAA

Web Site: www.chicoeaa.info
Contact: Jerry Brandstatt
530-343-0331

EVA OF SAN DIEGO (EVAOSD)

Web Site: www.evaosd.org
Contact: Elaine Borseth 858-395-8181

EVA OF SOUTHERN CALIFORNIA (EVAOSC)

Web Site: www.evaosc.org
Contact: Leo Galcher 949-492-8115

GOLDEN GATE EVA

Web Site: www.ggeva.org
Contact: Dale Miller, 415-472-0378

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Cell: 510-414-9948

NORTH (SF) BAY EAA

Web Site: www.nbeaa.org
Contact: Alan Soule, 707-477-1299

SACRAMENTO EVA (SacEV)

Contact: Guy Hall, 916-717-9158

SAN BERNADINO INLAND EMPIRE EVA

Web Site: inlandempireeva.org
Contact: Michelle Pierce, 909-238-9052

SAN JOSE EAA

Web site: rotordesign.com/sjeaa
Contact: George Stuckert
408-377-5037

SILICON VALLEY EAA

Web site: www.eaasv.org
Contact: Tom Sidle, 408-446-1538

COLORADO

DENVER ELECTRIC VEHICLE COUNCIL (DEVCC)

Web Site: www.devcc.info
Contact: J David McNeil
719-633-4924

CONNECTICUT

NEW ENGLAND EAA

Web Site: www.neeaa.org
Contact: David Oliveria
860-526-1460

DELAWARE

COASTAL CAROLINA WILMINGTON

Contact: Blair E. Brown. 910-617-1643

FLORIDA

CENTRAL FLORIDA EVA (CFEVA)

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Contact: Larry Wexler 407-256-6244

GOLD COAST EAA (GCEAA)

Contact: David Kerzel, 954-785-2184

NORTHWEST FLORIDA EAA

Contact: Nathan Kercher
850-472-0341

SUN COAST EAA

Web Site: www.suneva.org
Contact: Don Bouquet
941-739-2868

TALLAHASSEE AREA EVA

Web Site: www.taeva.org
Contact: Gillian Smith
954-829-1125

GEORGIA

EV CLUB OF THE SOUTH

Web Site: www.evclubsofthesouth.org
Contact: Anne Blair 404-849-7929

HAWAII

BIG ISLAND EVA

Web Site: BigIslandEV.org
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IOWA

IOWA EVA

Web Site: www.evohinc.com
Contact: Jeff Hove 515-250-2966

IDAHO

PANHANDLE EV ASSOCIATION PEVA

Website: www.panhandleev.org
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FOX VALLEY EAA

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INDIANA

HOOSIER EVA

Web Site: HoosierEVA.org
Contact: Richard Steiner,
317-987-4890

KANSAS

MID AMERICA CHAPTER

Contact: Al Pugsley Jr, 913-381-1091

KENTUCKY

EVolveKY

Web Site: www.evolveky.org
Contact: Jon Tyson, 502-644-1719

MASSACHUSETTS

DRIVE ELECTRIC CARS NEW ENGLAND EAA

Web Site: neeaa.org
Contact: Mark Scribner
860-336-7295

PIONEER VALLEY EAA

Web Site: pveaa.org
Contact: Karen Jones

MICHIGAN

MICHIGAN EAA

Web Site: michiganEAA.org
Contact: Larry Tuttle, 734-995-9904
eea.mich@gmail.com

MINNESOTA MINNESOTA EAA

Web Site: www.mneaa.com
Contact: Tom Helin, 651-246-5730

MISSISSIPPI

MISSISSIPPI EAA (MSEAA)

Contact: Luke Lundemo
601-981-6925

MISSOURI

GATEWAY EV (GEVA)

Web Site: gatewayev.org
Contact: Wayne Garver, 314-359-9626

NEVADA

EAA NORTHERN NEVADA

Web Site: www.lveva.org
Contact: Chuck Swackhammer
530-479-0269

LAS VEGAS EVA

Web Site: www.lveva.org
Contact: Lloyd Reece, 702-524-3233

NEW JERSEY

EASTERN ELECTRIC VEHICLE CLUB

Contact: Oliver H. Perry, 609-268-0944

NEW JERSEY EAA (NJEEA)

Web Site: njeaa.org
Contact: Michael Thwaite
908-405-8688

NEW MEXICO

NEW MEXICO EVA (NNMEV)

Contact: Richard Dunn, 505-672-1095

NEW YORK

GREATER HUDSON VALLEY EAA

Contact: Seth Leitman, 914-703-0311

GREATER NY EAA

Web Site: lieaa.org
Contact: Carl Vogel, 516-443-1715

NORTH CAROLINA

BLUE RIDGE EV CLUB

Contact: Joe Baum, 828-645-1412

CHARLOTTE EAA

Contact: Jess Montgomery
704-302-4156

TRIAD EVA

Web Site: www.tevaNC.org
Contact: Jack Martin, 336-213-5225

TRIANGLE EAA

Web Site: www.rtpnet.org/teaa
Contact: Deanne Mott, 919-783-8439

OHIO

CENTRAL OHIO EV ASSOCIATION (COEVA)

Contact: George Anderson
614-487-9671

EAA OF NORTHWEST OHIO

Contact: Michael Hall 419-691-1569

GREATER DAYTON EV ASSOCIATION (GDEVA)

Web Site: CleanFuelsOhio.org
Contact: Tim Benford 937-604-3158
tbenford@me.com

OKLAHOMA

EAA OF OKLAHOMA (TULSA)

Contact: Doug Duke, PE
918-260-8350

OREGON

EMERALD VALLEY ELECTRIC VEHICLE ASSOCIATION

Contact: Phil Barnhart phil@barnhart.us
541-912-5412

OREGON EVA

Web Site: oeva.org
Contact: John Christian 503-524-0873

OREGON SOHEVA

Web Site: soheva.net
Contact: James Stephens
541-552-9393

PENNSYLVANIA

THREE RIVERS EVA

Web Site: www.threeriverseva.org
Contact: Jonathan Belak
724-387-8210

TENNESSEE

CHATTANOOGA EVA

Contact: Randy Whorton, 423-822-1840

KNOXVILLE EVA

Web Site: www.knoxev.org
Contact: Gary Bulmer
gpbulmer@gmail.com

TEXAS

ALAMO CITY EAA

Web Site: www.aceaa.org
Contact: Craig Egan, 210-542-7707

AUSTIN AAEAA

Web Site: www.austinev.org
Contact: Aaron Choate, 512-453-2710

continued next page

HOUSTON EAA

Web Site: www.heaa.org
 Contact: Kevin Douglass, 713-927-6997
houstonxeaa@gmail.com

NORTH TEXAS EAA

Web Site: www.nteeaa.org
 Contact: Ron Swanson, 214-352-8180

UTAH**WASATCH EVA**

Web Site: www.wasatcheva.org
 Contact: Brian Flock, 760-271-8761
brian@flockgroup.com

VIRGINIA**DRIVE ELECTRIC RVA**

Contact: Charles Gerena, 804-560-3471

RENEWABLE ENERGY & EVA, DIY PROJECT CLUB

Web Site: www.reevadiy.org
 Contact: Mark Hanson, 540-473-1248

WASHINGTON**MID-COLUMBIA EVA**

Contact: Garrett Brown, 509-713-0806

NORTH SOUND EVA

Web Site: www.northsoundeva.org
 Contact: Jason Thompson,
 360-920-0287

SAN JUAN ISLANDS EVA

Contact: Bruce Nyden, 707-494-6693

SEATTLE EVA (SEVA)

Web Site: SeattleEVA.org
 Contact: Jay Donnaway
President@seattleeva.org

TACOMA EVA (TACEVA)

Contact: Jeff Finn, 425-643-4694

WENATCHEE EVA (WEVA)

Web Site: www.pluginncw.com
 Contact: Jack Anderson, 509-784-1747

WASHINGTON D.C.**EVA OF WASHINGTON DC**

Web Site: evadc.org
 Contact: Ron Kaltenbaugh
 240-586-0014

WEST VIRGINIA**WEST VIRGINIA ELECTRIC AUTO ASSOCIATION (WVEA)**

Web Site: www.wveaa.org
 Contact: Marty Weirick, 304 610-1617

WISCONSIN**WISCONSIN EAA**

Contact: Benjamin J. Nelson
 262-567-9348



National Drive Electric Week (NDEW)

Sept 14-22

<https://driveelectricweek.org/>

Danfoss Drive Used In Sweden's Biggest Hybrid Ferry

By Chris Randall

Danfoss Editron supplied the electric drive system for Sweden's largest hybrid car ferry to date. The ferry is now about to go into operation. The 100-metre Tellus ferry can carry 80 cars and 297 passengers per tour and will operate with a **battery capacity of 949 kWh** mainly in fully electric mode.

According to the press release, the Tellus ferry will "mainly operate on fully-electric mode", which will help contribute to the government target of becoming free of fossil fuels by 2045, and operate on one of Sweden's busiest maritime routes, transporting over 100,000 vehicles per month.

For what is to be the largest hybrid ferry put into operation so far in Sweden, Danfoss collaborated with Baltic Workboats shipyard. The batteries, provided by Corvus Batteries, are charged overnight at an onshore charging station, but can also be charged via the diesel engines during operation. The operator also plans to install automatic charging stations at the harbour to charge the ship during non-operation hours.

The Tellus ferry also features the Editron



load control system which automatically manages the system to minimise fuel consumption when the hybrid system is active. When powered in hybrid mode, the motor runs on a single genset, with the rest of the power coming from the batteries.

Jani Hartikka, Project Manager at Danfoss Editron, described the changing face of the maritime sector in the Scandinavian countries, which the company has played no small part in: "Similar ferries are already in operation in Finland and Norway, so we are thrilled to see Sweden

joining the movement. The electrification of the marine industry is a trend which will continue to grow as more countries introduce legislation related to reducing emissions in the sector. The versatility of our Editron system means that we can provide fully-electric and hybrid solutions for any kind of ferry. The future of the marine sector is definitely emission-free."

[Ed: Hybrids are good, but read about this Scandinavian neighbor's all-electric ferry. <https://newatlas.com/marine/ellen-all-electric-ferry-completes-maiden-voyage/>]



<https://www.electrive.com/2019/07/22/sweden-danfoss-supplies-drive-for-biggest-hybrid-ferry-yet/>

Here is EAA Director Marc Geller in an interview by Kenneth Johannessen, who is a writer for United Press International working on an article about electric vehicles. His excellent free-flowing style Q&A session with Marc quite accurately depicts the state of the electric world as seen in the summer of 2019.

Apple Podcasts Preview



Two Tales of Hope: Electric Vehicles and a New 'Obama-Biden Mystery

Conversation Collage

News

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In this edition, "Conversation Collage" explores the electric vehicle industry with a director of the non-profit Electric Auto Association. Also, a chat with author/humorist Andrew Shaffer, who turned Barack Obama and Joe Biden into fictional detectives for last summer's surprise bestseller, "Hope Never Dies". Now, he's back with a new mystery for the Democratic Duo, "Hope Rides Again."



<https://podcasts.apple.com/us/podcast/two-tales-hope-electric-vehicles-new-obama-biden-mystery/id1468962571?i=1000445848761>



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