

Electric Auto Association



CURRENT EVENTS

December 2018 Promoting the use of electric vehicles since 1967 Vol. 50 No. 12

A HUGE SPLASH AT THE LA AUTO SHOW



*One of the most exciting cars
at the LA Auto Show. See Page 6*



**School Based
EV Events**
... page 12



**EPA Reports &
Ratings**
... pages 22-24



**Rivian Electric
Pickup**
... page 30

Articles

- 1 A HUGE SPLASH AT THE LA AUTO SHOW
- 3 WHAT A DIFFERENCE WE MADE . . .
- 4 NOMINATIONS HAVE BEEN RECEIVED
- 5 DO YOU SHOP AT AMAZON?
- 5 THANK YOU TO OUR SUPPORTING MEMBERS
- 6 AUDI'S GORGEOUS E-TRON GT CONCEPT MAKES HUGE SPLASH AT LA AUTO SHOW
- 12 SCHOOL BASED EV EVENTS — Greater Washington DE Chapter Highlight
- 17 ARIZONA ADOPTS NEW EV POLICY TO SPUR NEW RATE DESIGNS, PILOT PROGRAMS FROM UTILITIES
- 18 ARIZONA CORPORATION COMMISSION ADOPTS POLICIES ON BIOMASS, EVS
- 19 HOW TESLA MODEL 3 COMPARES TO TESLA MODEL S ON 2,400 MILE ROAD TRIP
- 22 COLORADO ADOPTS CALIFORNIA AUTO GHG LIMITS, REBUKING TRUMP ROLLBACK PLAN — Inside Cal/EPA report
- 23 US SENATORS PROPOSE NATIONAL ZERO-EMISSION VEHICLE MANDATE
- 24 HOW THE EPA RATES ELECTRIC CARS: RANGE, EFFICIENCY & MORE
- 25 FINAL UPDATE: NOVEMBER 2018 U.S. PLUG-IN EV SALES REPORT CARD
- 26 VW'S ELECTRIFY AMERICA OPENS CALIFORNIA'S FIRST 350KW ULTRA-FAST CHARGER, BEFORE CARS CAN ACTUALLY USE IT — An urban type supercharger
- 27 TURNPIKE TO INSTALL ELECTRIC VEHICLE CHARGING STATION — Part of the effort to increase charging cross country
- 28 RHODE ISLAND PUBLIC TRANSIT AUTHORITY UNVEILS ELECTRIC BUSES — Investing in clean transit
- 28 METRO TRANSIT PLANS TO SHIFT BUS FLEET TO ALL-ELECTRIC — C Line rapid bus service in 2019
- 29 FEDEX ADDING 1,000 CHARGE VANS TO ELECTRIFY ITS FLEET — Built in China to operate in California
- 30 RIVIAN LAUNCHES WORLD'S FIRST ELECTRIC ADVENTURE VEHICLES™ WITH DEBUT OF R1T PICKUP — First of two vehicles to come
- 32 RIVIAN R1S ELECTRIC SUV GOES FAMILY STYLE WITH SEVEN SEATS, 410-MILE RANGE — Deliveries forecasted in 2021
- 33 AUTOMOTIVE STARTUP RIVIAN UNVEILS AN ELECTRIC TRUCK AND SUV
- 34 2020 KIA SOUL GETS FUNKIER AND ADDS A LONG-RANGE SOUL EV — Choose from naturally aspirated, turbo or electric power
- 39 THE ELECTRIC AIRPLANE REVOLUTION MAY COME SOONER THAN YOU THINK — Nine-person aircraft
- 41 VOLVO ELECTRIC TRUCK MAKING ITS WAY TO WEST COAST
- 43 ELON MUSK: TESLA TO DOUBLE ITS SUPERCHARGER CAPACITY IN 2019 — Dealing with range anxiety

Columns

- 3 PRESIDENT'S COLUMN
- 36 & 37 EVENTS & CONFERENCES
- 38 & 39 NOTABLE VIDEOS
- 40 EAA MEMBERSHIP FORM
- 42 & 43 CHAPTER LISTINGS



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Current Events Back Issues

The EAA has put most of its issues from 2001 to 2018 on its website.

Please visit

<http://electricauto.org/> and from the home page, click on "Documents" in the top navigation bar.

The resulting page has 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.

What A Difference We Made . . .

It's time to reflect on the great accomplishments of 2018. The work of our chapters, spread throughout the U.S. and Canada, has made a significant impact on the EV market. Our 1-1 talks with the EV curious have contributed significantly to the growing numbers of EV drivers. Our EV Owner/Educators were everywhere . . . Farmers' Markets, Earth Fairs, National Drive Electric Week events, businesses, hospitals, Capitol State Houses, high schools, universities, and coffee houses.

In California, EV sales are now 5% of

gave so generously of their time and talent in 2018.

We have great opportunities as well as challenges lying ahead. The good news is that we have over 50 years of experience, strength in our chapters, national organization, and a solid base, from which to grow even stronger. If you are reading this and live in an area not close to an existing chapter, why not start one? Let's expand our connections with each other next year. Look for EAA webinars and dial in conference calls as opportunities to share our best ideas.



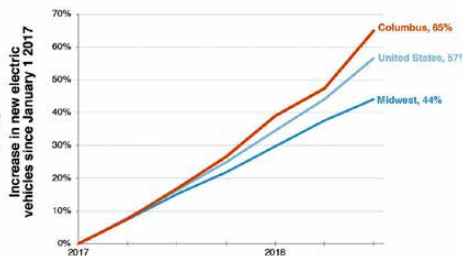
Raejean Fellows

Analysis by International Council on Clean Transportation, based on vehicle registration data from IHS Markit. Charging infrastructure data from PlugShare. Metropolitan areas and Midwest region are as defined by U.S. Census and Office of Management and Budget.

COMPARISON OF NEW ELECTRIC VEHICLE GROWTH: Cumulative new electric vehicles registered in the Columbus area has expanded by 65% since the start of 2017. This is the 2nd highest growth among the 15 most populous metropolitan areas in the Midwest. Only Dayton had higher growth over the same period (and the growth rate in Kansas City was nearly equal).

Increase in electric vehicles since January 1, 2017

- + 15%
- + 25%
- + 50%



Analysis by International Council on Clean Transportation, based on vehicle registration data from IHS Markit. Metropolitan areas and Midwest region are as defined by U.S. Census and Office of Management and Budget.

all new car sales, double the prior year. Sales are growing in the Midwest as well. Take a look at the striking results of the Dayton, Ohio chapter on its market. There appears to be a direct relationship between the highly productive Dayton EAA Chapter and the **70% growth rate in EV sales**. The organization of EAA's Owner/Educators at so many outreach events doesn't happen by accident. It requires BOTH the dedication and skill of more than 180 EV Owner/Educators AND the inspired, hardworking leadership of the chapter. Thank you to Tim Benford, President of Dayton Chapter and his team. However, Dayton is but one story. There are many other Chapter success stories like Tim's. Thank you to the teams of EV Owner/Educators and Chapter leaders who

EVs	EV #1	EV #2
Ford Fusion HEV	FF	2
Ford C-Max	C	3
VW e-Golf	eG	1
EMB e-Bike	E	1
Honda Accord HEV	HA	1
Honda Clarity PHEV	HC	1
Honda Civic HEV	HV	1
BMW i3	I	5
Kia Soul	SL	2
Nissan Leaf v1	L	11
Nissan Leaf v2	NL	1
Mitsubishi Outlander	O	1
Chrysler Pacifica	PF	3
Toyota Prius	P	6
Toyota Prius Prime	PP	2
Toyota Camry PHEV	CP	1
Mercedes-Benz Smart	SM	1
Tesla Roadster	R	1
Tesla Model S	S	21
Tesla Model X	X	5
Tesla Model 3	3	31
Chevy Bolt	B	3
Chevy Volt	V	13
TOTAL EVs in Group (EV #1 + #2)		117
Members with No EV yet		153
TOTAL EV Members		262

DED Events 2017-2018			
Event Date/Time	Event Name	Location	Total Volunteers / Event
11/14/2017	1st Planning Meeting	Carillon Brewery	19
12/9/2017	Chevy Bolt Review Ride & Drive	Voss Chevrolet, Collision Center	14
1/26/2018	DED Group Meeting	Dublin Pub	22
2/22/2018	Dayton Auto Show (4 days)	Dayton Convention Center	14
4/14/2018	Dayton Cars & Coffee	Austin Landing	5
4/22/2018	Earth Day Ride & Drive	Oakwood	16
5/3/2018	Ride & Drive	Springboro	11
5/19/2018	Parade & Auto Show	Oakwood	1
5/21/2018	Ride & Drive	Bethany Village, Centerville	1
5/24/2018	I-70/75 Economic Development Summit	Sinclair Community College	2
5/28/2018	Volunteer Hours Report	Home	1
6/8/2018	Voss Cruisin	Voss Chevrolet	14
6/14/2018	Ride & Drive	Centerville	1
6/27/2018	Ride & Drive	Oakwood	1
7/4/2018	Americana Parade	Centerville	7
7/7/2018	Dayton Cars & Coffee	Austin Landing	1
7/13/2018	Voss Cruisin	Voss Used Cars	6
7/28/2018	Farmers Market	Oakwood	2
8/5/2018	Green Street Ride & Drive	Carillon Park	3
8/19/2018	Classics On The Lawn	The Long-Romspert Homestead House Museum, 1947 Far Hills Ave. in Oakwood	3
9/9/2018	National Drive Electric Week Ride & Drive	Oakwood High School	18
9/16/2018	Concours D'Elegance	Carillon Park	1
11/17/2018	Christmas In Springboro Parade	Springboro High Street	13
11/29/2018	DED Planning Dinner	Troll Pub Dayton, Wayne Ave.	19
Events = 24		Volunteers =	195

Let's offer a welcoming hand to new EV owners to join Electric Auto . . . because together we really do make a difference!

Nominations Have Been Received

Upcoming Election for Three EAA Board of Director Positions

Now that the nominations have come in for the “Director” position on the EAA Board, it is closing in on the time for you to express your choice and vote for the person that will help us enter this time of huge EV and Association growth.

The election will be held at the official Electric Auto Association **Annual Meeting, Saturday, January 26th, 2019, 10 am – Noon**. Lunch to follow (optional) in San Francisco at the Google Community Room, 188 Embarcadero, (enter on Steuart Street) San Francisco, CA. EAA members should be receiving a Notice of Annual Meeting and a Proxy/ballot by mail. While we encourage you to attend the annual meeting, you need not be present at the meeting to vote. You can mail in your proxy/ballot. Candidate statements will be posted in the Members Only area (far right menu pull down). Go to <http://www.electrictauto.org> to review the candidates prior to voting. We have nine candidates running!

Candidate statements were submitted by the deadline of **November 30th, 2018** when nominations closed. Participants were able to nominate themselves, or someone else and submit nominations to Simon Freedman. If you have questions about the process you can contact Simon at: contact, Simon Freedman, Director at: SimonF@roadrunner.com.

We welcome your participation in our democratic electoral process. For those who have decided to step up to EAA leadership, the rewards you will receive, knowing what a difference you are making in the EV world, are electric!

If you live in the Bay Area or within driving distance, the election and the meeting/lunch will be worth the trip!

Save the Date!

EAA Annual Meeting and Elections: January 26th, 2019

Space limited. Registration recommended.
www.electrictauto.org/calendar



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High Voltage - \$500

Dowling, Tom; France, Jason; Green, James; Hinton, Tiffany; Sullins, Ben; Thesen, Sven

Supercharged - Plus \$240

Brown, Alexander
 Casner, Karen
 Cronic, Scott
 Dowling, Tom
 Freund, Ron
 Geller, Marc
 Greenberg, Steve
 Lervold, Joe

Supercharged Up - \$120

Arrison, Alan	Mathisrud, August
Braun, Stephen	McVeigh Wagner,
Bussler, Michael	Cindi
Callaway, Anton	Moret, Bernard
Clayton, Don	Moyers, Jordan
Comstock, Keith	Nisewanger, Jeff
Cuzzort, Kyle	Pease, Norman
Donnaway, Jay	Rogers, Kim
Finn, Jeff	Sanchez, Maurilio
Graunke, Gary	Schiller, Mark
Hayden,	Shipps, Richard
Christopher	Soule, Alan
Higham, John	Thorp, James
Jakobi, Lawrence	Thwaite, Michael
Kominowski, Rick	Walton, Matt
Matarese, Margaret	Williamson, Stuart
(Peggy)	

Charged Up - \$60

Anderson, Bob	Jungreis, Jason
Bagdasarian, Areg	Knight, Sam
Bakke, Kent	Kutz, Ray
Ballard, Lon	Heggie, Jen
Belanger, Nathalie	Julestrom, Stephen
Brentlinger, Douglas	Leury, Raymond
Bresswan, Tom	MacDonald, Douglas
Chatty, Omar	McCann, Sarah
Clark, Brian	McCaston, Robert
Conley, Steve	Meyer, Marla
Cornelius, Peter	Miller, Gary
Crow, David	Mitchell, Duff
Cummings, Mike	Noctor, Stephen
Distante, Stephen	Oring, Jeff
Duncan, Monica	Overstreet, John
Flax, Todd	Sasnett, Mike
Gale, Wayne	Shahidi, Ramin
Gilbert, Steven	Stack, Jim
Gilles, Patrick	Steiner, John
Haupt, Phil	Swackhammer, Chuck
Heaney, Michael	Terpak, Jared
Henke, Phillip	Voss, Joseph
Hoeck, George	Wypyszczak, Steven
Hughes, Mark	Zuteck, Michael

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Audi's Gorgeous E-Tron GT Concept Makes Huge Splash at the LA Auto Show



By Seth Weintraub

I'd be hard pressed to find a more exciting car here at the LA Auto Show than Audi's announcement of its sportback e-tron GT. Although the teasers and camo version drip released over the previous two days made it out to be a S7 sportback body plopped onto a 2019 Porsche Taycan powertrain, we were pumped to see more.

Seeing the real thing in person at an Audi event this week, which we were brought to on Audi's generous dime, was an experience unto itself.

Audi e-tron GT Presentation

We were brought to a non-descript parking lot in downtown Los Angeles Monday Night for the presentation which was MCed by Iron Man himself – Robert Downey Jr.

While I'm not a celebrity or RDJ fan in the least, the e-tron GT and its designer Marc Lichte really stole the show here. Lichte also participated in a roundtable with a few journalists where he espoused his affinity for electrification and the new opportunities it gives designers. While he was slightly strapped with the design parameters of the J1 platform / Porsche Taycan wheelbase, the freedom of losing the ICE

and exhaust more than made up for it. Lichte noted that he was a big fan of what Tesla was able to do with the Model S and was excited to have the same type of design freedom.

Audi says it wants to get to 15 models or 30% of its vehicles to EVs by 2025, which sounds anemic to me, but nonetheless was a point I heard touted over and over this week. That's not a new statement, but Audi is doubling down on it with the launch of the beautiful e-tron GT. All of the EV project managers I spoke to said they wish they could sell 100% EVs **but they said the reality is that most of its customers want ICE vehicles**. When pressed on ways to convert its brand-loyal customer base, the project managers and Lichte responded they convert people by making beautiful and sporty utilitarian electric vehicles. Educating customers is key here but **Audi is a business and showing customers the advantages of EVs is driving customers away from its ICE vehicles — which is a tough sale**.

Audi e-tron GT Dealers

Because of my horrific experience buying EVs at traditional automakers, I'm extremely skeptical of dealers actually trying to sell these vehicles. Obviously tuneups, oil changes

continued next page



than any EV currently on the road. We peeped a Mission E charging at over 250kW and we've heard tell that even the Audi e-tron SUV would charge at slightly over its 150kW rating for up to 70% of the charge. That's significantly above the current speed of Tesla's fastest charging options and puts the vehicle closer into the magical space where energy transfers as fast as gasoline. That said, we don't have any definitive stats on this car and won't until homologation closer to its USA launch in 2020.

How does Audi get this kind of charging speed while leaving others in the dust? Audi says its battery cooling technology allows its batteries to charge faster over a longer percentage period of the charge. This same cooling technology will also benefit the GT on the track where it will be able to attain its top speed for much longer than its competitors using the same hyper-fast cooling.



and basic maintenance are far less necessary on EVs which have far fewer moving parts than ICE vehicles, meaning dealerships are losing their bread and butter business there. Audi assured me in uncertain terms that their dealers were properly incentivized to sell these vehicles. I'm looking forward to testing the experience.

Additionally, each dealer would have at least one of the GTs on the lot in addition to other EVs including the e-tron SUV. Each dealer is required to have a medium speed 25kW CCS DC charger in the service bay area and some dealers (mostly in CA) were even opting to install faster CCS DC chargers in public spaces that could be used by the general public.

Audi e-tron GT Charging Speed

With its 800V system that it borrows from the Mission E/Taycan platform, the GT will charge significantly faster

At home, Audi includes a 40A 240V Home charger and works with Amazon to find NEMA 14-50 plug installers. That's eight amps more than the Chevy Bolt or Jaguar I-Pace, but still eight amps less than Tesla's high-end 48 Amp level two home chargers.

For long distance charging, Audi is leaning on Electrify America, which was formed on the back of the Volkswagen Dieselgate settlement. We're huge proponents of what Electrify America is doing, but remain skeptical that they will be able to put together a cohesive charging network by 2020. Obviously with its CCS standard, the e-trons will be able to charge at any CCS combo charge point which typically currently max out at 50kW. That means for many trips, charging stops might be over an hour, at least for the foreseeable future.

continued on page 8

Audi's EV

continued from page 7



Audi e-tron GT Specs

You want Audi e-tron GT specs? We've got Audi e-tron GT specs for you. The drivetrain might sound familiar if you've been following the Porsche Taycan saga with its 800V charging and motor system. But besides the skateboard underneath and some oddities like the windshield and part of the B-Pillar, the GT is totally bespoke and a separate vehicle.

- 4.96-meter (16.3 ft) length, 1.96-meter (6.4 ft) width and 1.38meter (4.5 ft) height
- 434 kilowatts (590 horsepower) system power
- 95kWh battery mounted below car and with bumps below seats and cutouts near feet
- 150+kW Fast charging to 70% and a step down from there
- Two motors, AWD
- **Acceleration:** 0 to 100 km/h (0-62.1 mph) in around 3.5 seconds before going on to 200 km/h (124.3 mph) in just

over 12 seconds. The top speed is regulated at 240 km/h (149.1 mph) to maximize the range

- 285/30 size tires, 22-inch wheels
- **Range:** Over 400 kilometers (248.5 mi)
- Four passenger interior
- Driver side charging with option of additional passenger side charger port
- **Storage:** 450 liters (15.9 cu ft) of luggage capacity.
- **Frunk:** 100 liters (3.5 cu ft) of capacity

Electrek's take:

Let's take Audi at face value here. The people involved with the e-tron and specifically the GT are EV fans. They want to build a compelling EV and by early looks have emphatically done so with the GT.

The 3.5 second 0-60 times aren't going to beat a 4-year-old Tesla, nor is the charging infrastructure. But hopefully Audi chooses to aim this car elsewhere, namely its installed base of brand loyal, ICE-driving fans. Late 2020 can't come soon enough.

<https://electrek.co/2018/11/28/audis-gorgeous-e-tron-grand-turismo-makes-huge-splash-at-the-la-auto-show/>

Audi's E-Tron Blends Luxury With Cutting-Edge Tech

A tech-filled SUV that'll woo fans of gas vehicles.



give us a peek into what we can expect from Audi.

The new E-Tron comes with Audi's all-wheel-drive "Quattro" system, which is powered by two electric motors, powered by a 95kWh battery under the floorboard. That array of cells comes with an eight year/100,000 mile warranty and if any of the modules go bad, Audi says the entire battery setup can be removed and the offending cells can be replaced. That should ease the minds of those concerned about what happens when part of a battery goes south.

By Roberto Baldwin

We've already seen the first pure-electric Audi in teaser images, under QR-code camouflage and even unveiled under a barrage of lights accompanied by a DJ set from Diplo. But no amount of pomp and circumstance, sly marketing or famous DJs matter until you get behind the wheel. Good news then, that I finally had the chance to drive the Audi E-Tron in a barren desert, about as far as you can get from a well-orchestrated launch party.

The Audi E-Tron will land in the second quarter of 2019, in an increasingly crowded electric-SUV segment. But its main competitors will be the Tesla Model X and the Jaguar I-Pace. Both are outstanding vehicles and the German automaker needed to make sure it could compete with those and rival SUVs coming from BMW and Mercedes-Benz. So far, it looks like Audi pulled it off and the E-Tron is a great debut into the EV world for the automaker.

This isn't the first Audi E-Tron though -- the Audi A3 hybrid gets that honor. But that will be the last E-Tron with a gas tank. The new SUV (starting at \$74,800) with its two electric motors ups the ante of the E-Tron brand and paves the way for the upcoming E-Tron GT sedan (announced at the LA Auto Show, coming in 2021). While the 2019 E-Tron shouldn't be expected to perform like a sports sedan, it does



That battery pack provides about 400 horsepower and 489.7 foot-pounds of torque. On straightaways and highways, I overtook cars with little effort for an SUV — Audi says it'll do zero to 60 in 5.5 seconds. The acceleration won't impress your friends that much (especially if they've been in a Tesla), but it's more than adequate for 99.9 percent of your daily driving.

continued on page 10

Audi's EV

continued from page 9

Audi gave me the opportunity to take the vehicle on some dirt roads heavily dusted with desert sand. The Quattro system did a great job making sure I stayed on the road and not get stuck in the loose sand. Audi was quick to point out that it's not a robust offroader but my drive suggests it will be capable enough for most on dirt roads (without too many ruts) or out in the snow.

Cornering was fine on dirt and sand roads where ruts and drifts can lead a vehicle to a bad situation pretty quickly. On asphalt, it's more than adequate to make highway on-ramps and measured drives through mountain roads enjoyable. It corners better than the Model X, but not as precisely as Jaguar's I-Pace. That's to say, it'll get you to your chalet during dry and snowy conditions with no problem, just don't expect too much of it while going around actual corners.

There's regenerative braking here, too. Testing it on the mountain roads in the United Arab Emirates, I was impressed by how quickly I could generate battery power -- you can even control the level of regeneration while coasting with the steering paddles. The highest setting was enough to slow me down from a moderate speed to get around a sharper-than-usual corner.

The brakes are the real technological feat here. The first 0.3 G of deceleration (light braking) is handled by the two motors, that then feed that energy to the battery. Anything more than 0.3 Gs and the traditional hydraulic brakes take over. Like most electric vehicles, you can also adjust your driving behavior to extend the range and see real-time results in the display in the dash cluster.



continued next page

There's also the traditional charging setup. The vehicle ships with a DC fast charger port and can accept up to 150kW of power. Unfortunately, it's tough to quantify that into range per minute of charge. It's fast, but the automaker still needs the EPA to give it a proper rating for the United States. The European WLTP test gives it a range of 248.5 miles but the EPA's more stringent tests should be less than that. That information should be available closer to the release of the car in the United States.

Meanwhile, the in-car tech is powered by Audi's new MMI infotainment system. Like the system found in the A7 and A8, it's a great update and a frustration-free experience. Even the climate controls which use the second display (below the main one) are easy to use and because Audi places the shifter near the system, you're wrist can rest on the housing and you can quickly build up muscle memory to adjust the temperature.

The adaptive cruise control and lane-keep assist are also new and are carried over from the sedan line. I noticed that the centering was a bit tighter on the E-Tron than on the A8, but that may be due to the well-maintained roads around Abu Dhabi. They are far nicer than the roads around Big Sur where I drove the Audi Sedan.

Another small update to the system is the capacitive touch detection that senses if your hands are on the wheel -- a first for Audi. As long as I was touching the wheel, I didn't have to periodically wiggle the steering (to produce a bit of torque the car could register) which is how the system reminds you to put your hands back on the wheel. It's a pleasant upgrade that should please anyone that does a lot of long-distance driving (or is stuck in gridlock on a regular basis).



One feature I thought I'd like more were the side cameras and displays that replace the side mirrors. They're not allowed on US roads, so the chances of people experiencing them here are slim. The side-view displays are situated in the uppermost corner of the front doors just below where you would look with a traditional side-view mirror. To adjust the view angle, the driver's side is a touchscreen that you tap and drag to move the virtual mirror. They're slick but after a day of using them, I'm not really a fan. As with anything new, you have to train your brain to not stare at the tiny cameras attached to the side of the car and instead look down a few inches to see what traffic is doing around you.

The problem is, other than making cars a bit more aerodynamic, there isn't much value in adding more displays and cameras to a car when a mirror does the same job. I did like that the edge of the display glowed yellow when a car was behind me, but you could add that to a mirror.

Maybe if I get the car for a week, I'll come away a believer in a side camera and displays instead of mirrors. But that's unlikely since any car brought to the United States wouldn't be allowed to have the system. And since they're not

allowed in this country, my thoughts on their usefulness have no real bearing on the car overall. I would have preferred a rear-view camera like the one found in Cadillacs and Chevy Bolt.

Crazy new side-view technology aside, the E-Tron is an outstanding Audi that just happens to be electric. It has all the usual Audi luxury and if you like the company's SUVs, you'll like this. Probably even more so because it's quiet, the torque is great and the fast charging means if your town has the infrastructure (which Charge America is hoping to roll out quickly) you can quickly charge while out and about. The biggest disappointment is that we have to wait until the middle of next year to get it.

The E-Tron, like the I-Pace and Model X, show that electrification and utility are not mutually exclusive. And if you can get some luxury in there at the same time, you might as well pamper yourself while doing your part to reduce your carbon footprint.



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<https://www.engadget.com/2018/12/07/audi-etron-first-drive/?yptr=yahoo#/>

Chapter Highlight



This report will feature short activity summaries from our various chapters to foster knowledge transfer. Such sharing can be powerful for planning new startup activities, special meetings, or just reinvigorating established groups as we grow into our second 50 years of pioneering e-mobility.

School Based EV Events



Figure 1 – EVs lined up in front of the High School ready to be shown to the students (Photo Credit: Scott Wilson)

By Bob Erdman, EVADC

Our EV enthusiast community has a number of ways to reach the general public to help educate them about the benefits of driving electric vehicles. The best known is National Drive Electric Week (NDEW), as highlighted in the *October 2018 issue of Current EVents*. My local EAA chapter – the EVADC (Electric Vehicle Association of greater Washington DC), has supported NDEW along with local Earth Week events, a Science Day festival and other local events.

I have been involved in a quite a few car pools over the years, taking my two teenagers and their friends to and from activities using either our Chevy Volt or Tesla Model S. Every now and then I would get EV related questions. “How far can you go?”, “How high is your electric bill?”, “Can you take a long trip?” It was great being able to answer these questions and encourage their interest in EVs.

In order to reach many more students, I created a project to reach younger members of the public by documenting the resources needed to bring EV Events to schools. An example of an easy event would only require arranging for 4-10 EVs to be parked in front of a High School during the student’s lunch period.



Figure 2 – AP Environmental Students ask questions about the Electric Car (Photo Credit: Bob Erdman)

I encouraged other EVADC members to contact any science teachers they knew to make them aware of the project. We have had a few events and have more planned in the spring.

One of our members is a high school student who convinced his parents to buy an electric vehicle several years ago. He plans to organize an event in the spring at his high school.

Our events have been jointly organized by teachers and EVADC. We provided EVs and their owners – the EV advocates to answer questions. We also provided flyers containing information about EVs and all the EVs available for sale in the area. The teachers provided some questions for the students to ask and worked with the school staff to get approval and determine the time and date for the events. It just took one meeting over lunch with the teacher and about five emails with the EV owners to organize the event.

To make it easier to share information and scale the project, I created a website which contains the information needed to create a school based Electric Vehicle event at High Schools, Community Colleges or Universities.

<https://evadc.org/school-ev-events>

continued on page 14

EV Educational Resources

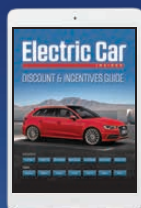
for Individuals, Groups and Organizations

Electric Car
INSIDER



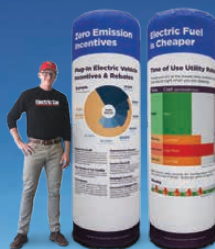
EV Buyers Guide

Compare electric cars with comprehensive full page profiles



Discount Pricing Guide App

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

School Based Events

continued from page 12

The idea is that a teacher, parent or student would use the information in the website to request the resources needed to hold an event. These are primarily the Electric Vehicles along with their owners, the EV advocates.

The website also contains examples of past events with a short description of each past event including photos. After future events are held, I hope to get a writeup, especially for any events that have new ideas that subsequent events could leverage.

The first URL links to the summary of the most recent event at Walt Whitman HS. The second link is to an article from the Walt Whitman HS newspaper about the EV Event <https://evadc.org/school-ev-events/past-school-ev-events/whitman-high-school-november-2018/>

<https://theblackandwhite.net/61481/news/electric-car-showcase-teaches-students-value-of-clean-energy>

The School EV Events website also has ideas for different types of events. One of my favorites is an event that would be organized by students in conjunction with another school event, such as an Earth Day event, or an event in the parking lot of the school just before a football game. It would be great if students could leverage the resources we could provide while at the same time getting some EVs from parent owners if they exist. Not only would this make it more of a community event, but it could also inspire some of the parent EV owners to become EV advocates as well if they aren't already.

The website is meant to be self-contained. If a teacher has the link, he or she should be able to find what is needed for help setting up an event.

At first, I thought the best way forward would be to try to grow this project slowly so it could improve with each event, but since the organization of the event is like a mini-NDEW event, I don't see any reason not to try to grow this fast.

If you are interested in helping with this project, you can start by contacting teachers or professors to see if they are interested in hosting an event. Your local EAA chapter or captains from past Drive Electric Week events are sources for finding Electric Vehicles and their owners. I would be happy to help by finding EV Owner advocates which are local to the school interested in an event.

Conclusion – To wrap this up, curious students may soon understand that there are so many factors that affect EV driving range, much like with ICE cars, but they become more immediately visible. Speed kills range. Accessories don't matter as much (except for heating and cooling loads). Vehicle losses are different for colder air temperatures and with commensurate heater use. I used 230 miles as a "guess-timate" for my average winter maximum range to underscore that there is a difference. Brand new owners will soon find out about these influencers. Every EV story will be different.

Special thanks to Charles Gerena from Drive Electric RVA for reviewing and providing suggestions for the School EV Events web site.

Bob Erdman can be contacted with questions, ideas or leads for any EV events at schools at bob.erdman@gmail.com or 301-910-4587 (Cell).

Data Capture Sheet Example

This sample capture sheet was sourced from the Poolesville HS and Walt Whitman HS events, and includes some additional questions added by the local EV community.

When used as a resource by teachers or event organizers it can give students guidance during their discoveries to help them better understand Electric Vehicles.

When used, all the text in italics can be removed, and the questions can be tailored to specific classes – for example Physics or AP Environmental Science – or just for the general student population.

The following are the author's comments on the results of using this approach at the Whitman HS event. The intention is to acquaint individual students with information that their personal EV Capture Sheet contains.

<https://evadc.org/wp-content/uploads/2018/09/EVInfoSheet-20180903.pdf>

Make, Model, Year, Cost, Total miles Driven gas-free, weight of the vehicle – These were all fairly well understood and quick to answer.

Range (New) – This question gives insight on loss in range with increasing miles driven or age of the EV when compared to the Range (Current). Owners of new vehicles

continued next page

may not have this data yet. My range (New) was 265 miles.

Range (Current) – I gave the summer range as 250 which was what it was the last time I charged it to the top.

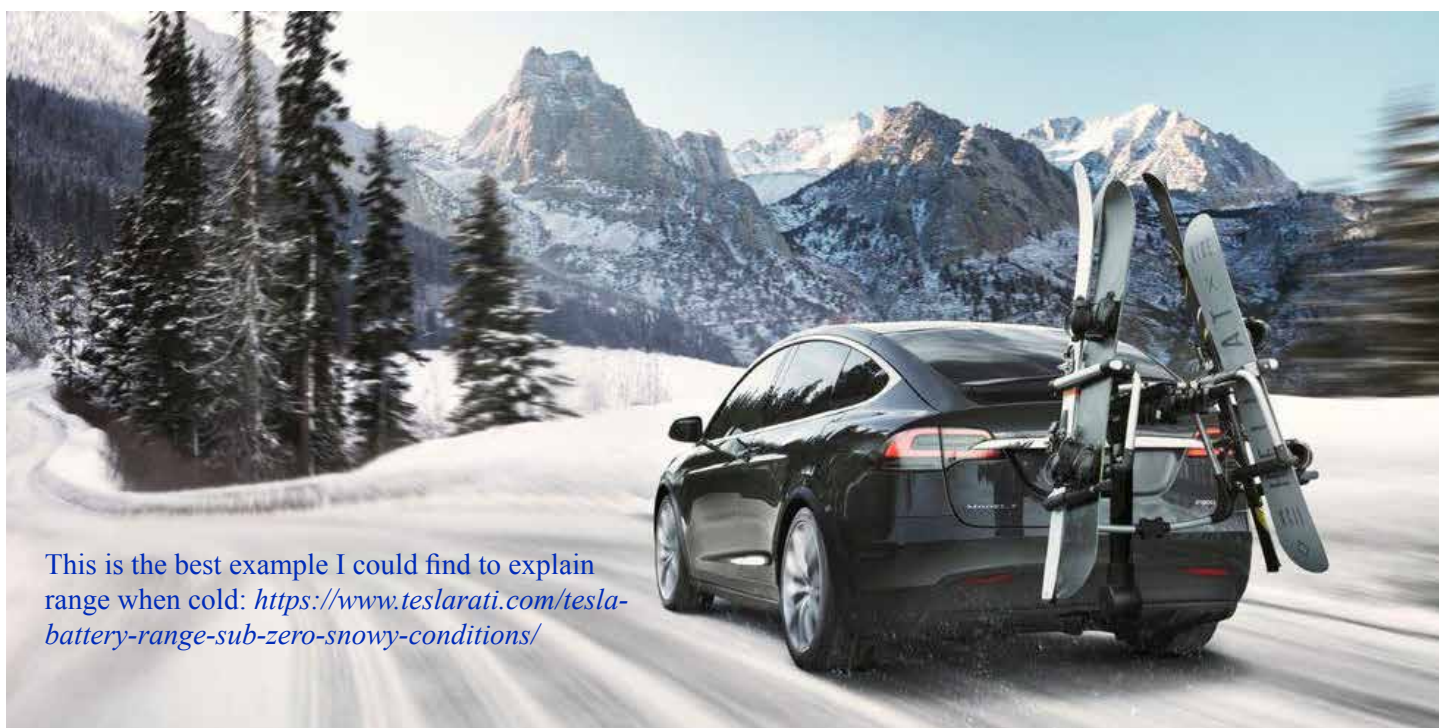
Battery Degradation – I told the students that my car when new could deliver 265 miles of range, yet have lost 15 miles over five years of ownership. If the rate of loss stays somewhat linear, I may not need a new battery for another 15 years since even on long trips, given the spacing of Supercharger locations, 200 miles of range is okay.

<https://about.tesla.fi.com/temperature-efficiency-2/>

This website has the data from an owner's own test over a month. Snow and ice affect traction, as does rain which affects the amount of energy conveyed on the pavement.

<https://www.teslarati.com/tesla-battery-range-sub-zero-snowy-conditions/>

Longest Trip – Easy to answer and allows the EV Owner to give the student an idea of how the EV can be used.



This is the best example I could find to explain range when cold: <https://www.teslarati.com/tesla-battery-range-sub-zero-snowy-conditions/>

Range (Winter) – Not easy to give a short answer that is also accurate. The loss depends on the temperature and maybe if it is parked in a garage or not. The best answer may depend on the region where one lives. The loss for an average cold temperature of 32 degrees is around a 25-30% loss based on information from two websites.

One man's testing done over several months revealed differences found when there was snow and ice on the road. This directly affects traction and hence energy usage per mile. Considered also air density at lower temperatures.

The website below has some detailed information about efficiency measured at different temperatures. Divide the EV's storage (kWh) by the wh/mile to get expected range. Using that data, a Tesla Model S 85 at 75 degrees uses 330 wh/mile or should get $85,000/330 = 258$ miles.

Favorite EV Story – Another chance for the students to learn something interesting about EVs. One of my favorites is when an EV showed that it didn't have enough miles left to reach a charger. By slowing down to 40 mph the EV was able to make it, getting a surprisingly higher range at that speed. [Ed: Aerodynamic losses at work.]

Questions from the AP Environmental Science Exam – These are good to include if there are students taking the class. Even if they don't get good answers from the EV Owners, it could encourage them to try to learn more independently or in class.

The answer key is online. Interesting that it came from the exam given in 2002!

https://secure-media.collegeboard.org/apc/sg_envir_sci_02_11517.pdf



School Based Events *continued from page 15*

Data Capture Sheet

Name _____ Period _____ Date _____

List the following for 2 or more electric cars:

Make			
Model			
Year			
Cost			
Total miles Driven gas-free			
Pack voltage			
Energy storage			
Range (new)			
Range (current)			
Range (winter)			
Weight of the vehicle (on door pillar)			
Longest Trip			
Favorite EV Story			

- (a.) Identify and describe two environmental benefits to using electric vehicles in place of gasoline-powered engines for transportation.
- (b.) Describe TWO economic impacts (excluding costs related to climate change resulting from CO2 emissions or the cost of gasoline at the pump) that result from an increased number of BEVs on the road.
- (c.) Propose two potential new US government or state policies that would encourage the widespread use of electric vehicles. Explain.



Arizona Adopts New EV Policy To Spur New Rate Designs, Pilot Programs From Utilities



By Robert Walton, Utility Dive

In Brief:

- The Arizona Corporation Commission (ACC) voted this week to adopt an electric vehicle (EV) policy that encourages investor-owned utilities to develop new rates and pilot programs supporting EV growth, and which ensures they can recover “prudent costs” spent to develop charging stations. Some verbal changes made at the ACC’s meeting will be included when a final version of the policy is released in the next few weeks.
- The ACC’s policy calls on utilities to propose optional rate design tariffs to encourage off-peak charging, and to develop outreach and education programs focused on EVs, infrastructure and electrification of the transportation sector.
- Emissions-free vehicles are already beginning to gain acceptance throughout the state, and regulators see an opportunity to stake out a leadership role. Tesla competitor Lucid Motors has plans to build a \$1 billion EV manufacturing plant

in the state, and ACC staff said they see the EV policy as a way to “send a signal to EV manufacturers to locate in Arizona and spur economic development.”

Insight:

As utility commissions tackle EV issues, the topic of how to pay for infrastructure is frequent and contentious. And it is a pretty simple argument to understand: why invest in charging stations without any stake in ownership?

Case in point: Arizona regulators just voted 4-1 in favor of the new EV policy, and the last filing in the docket currently comes from a stakeholder relying on a familiar refrain: “I’m writing to ask that you do not raise my electric bill to fund all-electric car charging stations. I should not have to pay for these as I do not own an electric vehicle.”

Commissioner Bob Burns said he received more than 90 of these emails.

But the charging stations benefit all customers in a variety of forms, from economic growth to distribution system utilization, say regulators and utilities. The state has worked to attract

driverless car development, and is now looking to do the same with EVs.

The policy approved by ACC notes the EV industry is growing rapidly in Arizona, and the state has hundreds of public EV charging stations and thousands of EV vehicles on the road — with both numbers “showing huge growth year-over-year.”

ACC staff pointed to nine benefits, from rate designs that reduce peak load to increased grid reliability, lower service costs to consumers, and lower healthcare costs as well.

Plug in America told the commission that some studies have shown EVs can provide “significant benefits” to rate-payers. Specific to Arizona customers, one study showed annual savings of up to \$176 per household by 2050, thanks to a 5.5% projected rate decrease.

Katherine Stainken, policy director at Plug in America, says the state does view electric vehicles as an opportunity, but that’s not the reason for the EV strategy.

“I do think Arizona wants to attract industry,” Stainken told Utility Dive. “If anything, Arizona is catching up to other states that are moving forward with policy guidance. This is a growing area of conversation at national utility regulator conferences.”

Tuscon Electric Power spokesperson Joseph Barrios said the utility understands customers are extremely sensitive to any cost increases, and programs are reviewed thoroughly to ensure costs are prudent. But he also

continued on page 18

Changes to AZ EV Policies

continued from page 17

said that similar to efficiency programs, which all customers contribute towards, electric vehicles are expected to be a net positive for the system though well-designed rates.

“By reducing the amount of power we have to deliver on peak, that helps to reduce costs, and those lower costs are factored into all customer rates,” Barrios told *Utility Dive*.

“EVs are good for the environment, will save customers money, and help keep more energy dollars in Arizona,” Arizona Public Service spokesperson Suzanne Treviño told *Utility Dive*. And implementation of the state’s EV strategies “will help all customers, not just those driving electric vehicles.”

Last Minute Changes

There were some significant “verbal amendments” made to the memorandum before the commission voted, ACC spokesperson Holly Ward told *Utility Dive*.

Policy statement #8, which focused on second-life battery operations, was removed entirely. It had read: “Public Service Corporations should encourage the utilization and redeployment of used EV batteries for a secondary use.”

There is significant interest in the use cases for a stream of used batteries that is expected to appear once EVs take hold at scale. While no longer viable for EVs, the batteries can have up to 70% of their capacity remaining, which has led to multiple car manufacturers partnering with energy companies.


Commissioners also made an important change to statement #5, adding a prudence requirement and some conditional language to the second sentence to

finally read: “If the Public Service Corporation deploys EV charging stations, the prudent costs of this infrastructure may be included in rate base.”

The first part of that policy statement says utilities “could deploy EV charging stations” in low-income areas, multidwelling units, interstate corridors or highways, and other areas

Ward says a final commission decision/policy statement will likely be finalized within the next few weeks.

Plug in America’s Stanken said the policy guidance regulators approved “opens the door for utilities to start putting together larger EV programs. There should be many more stakeholder groups going forward in the new year expanding on the policy and what utilities can/can’t do,” she said in an email.

 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.

<https://www.utilitydive.com/news/arizona-adopts-new-ev-policy-to-spur-new-rate-designs-pilot-programs-from/544853/>

Arizona Corporation Commission Adopts Policies On Biomass, EVs

By Kevin Randolph

The Arizona Corporation Commission (ACC) adopted policies related to biomass, electric vehicles and other matters at its monthly Open Meeting this week.

The ACC voted to adopt a policy statement on the use of forest bioenergy, biogas, and biomass as a renewable energy resource. The statement directs utilities to examine having 60 megawatts (MW) or more of biomass energy developed through renewables. The affected utilities would be required to obtain their share of the 60 MW total

as determined by a one-time allocation by the affected utilities.

The policy statement applies to electric utilities regulated by the Corporation Commission. The ACC also encouraged regulated electric utilities, non-regulated electric utilities, and other interested parties to work together to use bioenergy as a resource.

The commissioners also adopted a policy to encourage regulated utilities to invest in electric vehicle infrastructure and develop programs for supporting electric vehicle charging.

The Corporation Commission staff noted that the benefits of the policy could include rate designs that reduce peak load and take advantage of times with low-priced electricity, enhanced grid reliability, future possibilities of vehicle-to-grid integrations and lower costs for consumers.

The ACC also voted to allow same-day approval of expedited online LLC filings and to have three major electric utility companies establish or modify their alternative generation rate schedules for medium and large size commercial customers.

<https://dailyenergyinsider.com/news/16716-arizona-corporation-commission-adopts-policies-on-biomass-electric-vehicles/>

How Tesla Model 3 Compares To Tesla Model S On 2,400 Mile Road Trip

By Kyle Field

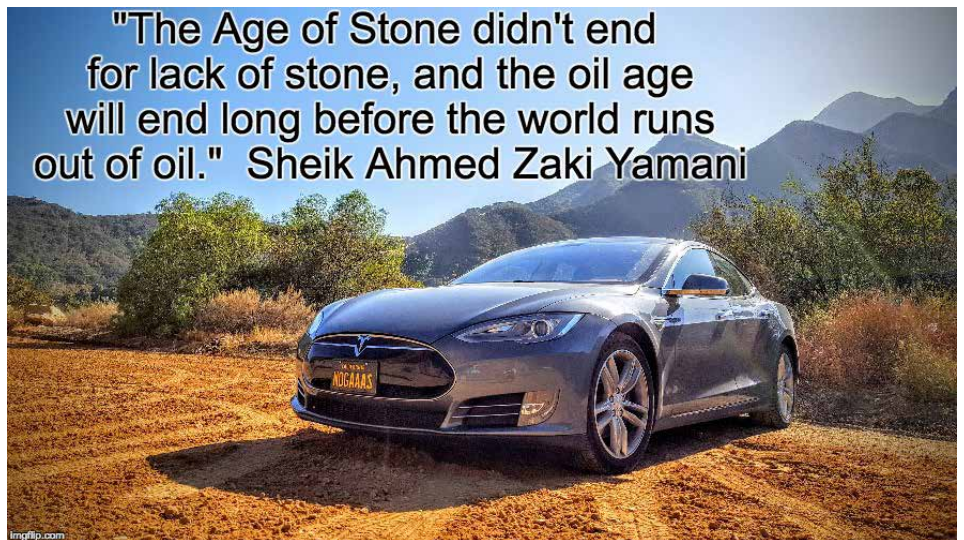
Back in 2015, we bought a 2013 Tesla Model S and purposely purchased it from the Tesla Service Center in Columbus, Ohio, even though we live in California. It wasn't the closest location to our home in Ventura, but it gave me the opportunity to see how the car and Tesla's Supercharger network stacked up to the hype when put to the test.

Rolling out of the Columbus Tesla Service Center on December 30th, 2015, after the documents were signed, I was officially committed to the task and some 2,400 miles and several mountain passes away from home. I documented the experience in a few videos and articles and generally found it to be a very pleasant experience. I powered through some really long days of driving and was also able to stop in Las Vegas for the CES show that year.

Fast forward to this year and we had the opportunity to take the CleanTechnica Tesla Model 3 on a road trip from our home in Southern California to Colorado Springs, Colorado, to visit my family for the holidays. While both trips went off without a hitch, this year, we actually had options for where to charge and where to eat.

In 2015, the Supercharger network was robust, but it provided just the minimum charging infrastructure that was required to allow for travel along the key arterial routes. Skipping a Supercharger then was possible but not advisable with the 265 mile range of the Model S.

Today, the 310 mile range of the Model 3 paired with the higher density of



Supercharging locations meant that we were able to charge in Barstow, California, instead of Yermo to have

more options for food. We were able to zoom out on the charging map and
continued on page 20

2,400 Mile Trip

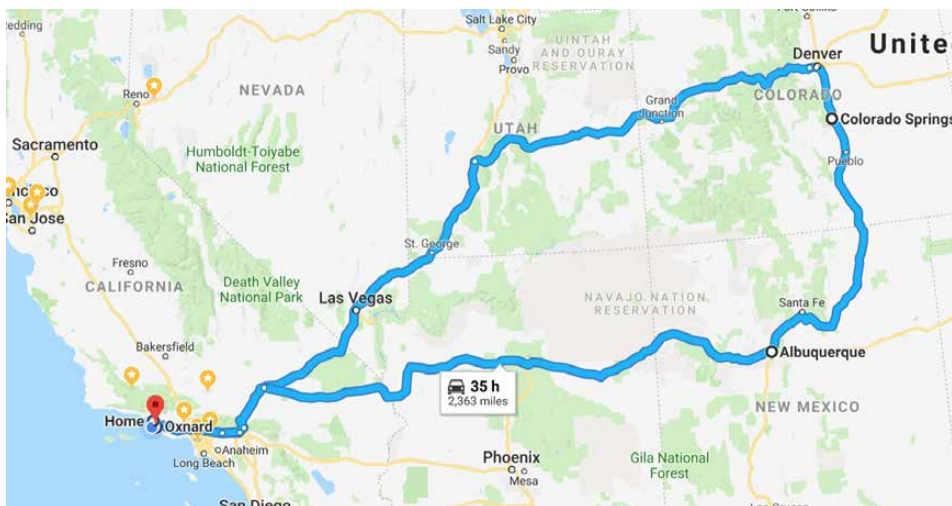
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charge for an hour at lunch to skip a charging location that we weren't interested in.

Driving all those miles in the Tesla was a dream. The electric drivetrain in the vehicle makes the ride a smooth and enjoyable one. The technology that Tesla has built into the car also makes the ride a pleasant experience for passengers. My kids were able to keep their gear charged up in the back seats while my wife was able to play her favorite audio book from one of the USB drives up front.

The increase in Supercharger location density meant that we also had options when arriving or departing town. When we stayed in Kingman, Arizona, we opted not to charge before crashing for the night at the hotel and instead charged in the morning and walked to the nearby "World's Largest Electric Vehicle Museum" just a few blocks away. Thankfully, it was one of the only museums in town that was open on Sunday and it was great to see.

On the flip side, we found that the drastic increase in Teslas on the road meant that we were running into Supercharging stations that were full or approaching full. To clarify, in the ~14 stations we used, one was full (Albuquerque, NM, which had just 6 stalls) and we were the last slot in another station (Denver, CO) which had new signs up that requested owners keep charging sessions to a maximum of 40 minutes. This was not enforced with software and there did not seem to be anyone at the Supercharger checking on this, so it was more of an honor system than anything.



Don't read this as an apocalyptic proclamation that all of Tesla's Supercharging locations are full across the country, but rather, they are filling up as tens of thousands of new owners across the United States hit the roads every month. It also means that empty

Supercharging stations with guarantees of full power charges are likely a thing of the past, so build a little more time into your schedule if you're planning to charge, especially in high-density charging areas like the Los Angeles and San Francisco metro areas.

continued next page

The Supercharging experience is still seamlessly integrated into the onboard navigation, which means that all you need to do is to type in the destination or use the voice commands to get the navigation going and it will automatically navigate to the next Supercharger along the route. As I said, there may be better options for charging in terms of food or the number of stops, but the system seems to do a good job at minimizing the total travel time

After waiting for the specified time at the Albuquerque Supercharger, we unplugged and headed on our way, only to find that the estimated range crashed precipitously, forcing us to reduce our travel speed to make it to our destination in Gallup, New Mexico. There were no other Superchargers between those two points, so we didn't have any options to top up the battery. Tesla's Supercharging map shows that they are working on a new location that they expect to come online in the next two weeks, but the dynamic nature of the range estimator was something we struggled with on our trip.

The accuracy of the range estimation was an issue on the Model 3 and the Model S as we contended with a number of variables that absolutely slam the battery. Driving at speeds higher than 65 miles per hour zaps the battery and with the speed limit regularly topping 70 and sometimes even 80 miles per hour, even driving the speed limit was draining the battery faster than it seemed the range estimator expected. As an outsider looking in, this is someplace where it seems Tesla could do a better job. The speed limits and vehicle efficiencies at those speed limits are known variables and it seems could be taken into better account for some routes.

Elevation changes along the route are similarly static and should be integrated into the navigation range estimates. We regularly charged farther and longer than the navigation asked us to and still ran into issues twice where we had to lower the cruise control set point and decrease the interior temps to make to the destination. The lowest we had the car was 20 miles or so of range, but on a deserted highway in temperatures below freezing at -5°C with the whole family in the car, that was cutting it a bit close for comfort.

[Editor's note: I've previously reported that Tesla's navigation system does seem to take all of these factors into account, and I have gathered some intel that indicates I was not being delusional expecting that. However, it seems like some scenarios still outsmart Tesla's smart navigation system, such as temperatures dropping quickly or people driving faster than expected for that route. I'm not sure what caused the less than ideal estimates in Kyle's case, but am now curious.]

Low temperatures also have a detrimental effect on the range of the vehicle, but we really didn't hit too many stretches of low temps, with most days above 0°C/32°F. We did run into one stretch on the way into Green River, Utah, where the low temperatures, high speed limit, and elevation changes conspired against us to the point that we were really happy to make it to the Supercharger before ambling across the street for some warm food. We were never to the point where it became critical, but it was definitely to the point where we felt we had to manage around it.

The total cost of the trip would have been around \$160, but because Tesla

had granted free Supercharging to everyone living in the vicinity of the California wildfires a few miles from our house, we did not pay anything for the trip. We had planned the trip before this all came about, so that's just how it worked out. (Thanks, Tesla!).

If we would have paid, at Tesla's California Supercharging rates of \$0.26/kWh and the Model 3's efficiency of 3.85 miles per kWh, our cost would have been about \$160 compared to over \$280 for a gasoline vehicle getting 25 miles per gallon at \$3.25 per gallon. These are both California prices to keep the playing field level.

Summary

Overall, the trip was a blazing success. We had a great technology-fueled drive across half of the country and back without running into any showstoppers. It's clear that the Tesla Supercharging network and its vehicles are both improving but the work will only continue for Tesla as the number of Tesla vehicles on the road only continues to climb.

There continues to be an opportunity for improving range estimation in the car, but this can be remediated with additional Supercharging locations and educated owners who charge conservatively by adding an extra 20% buffer to Tesla's estimates, just in case.

Having said all that, the Supercharging network paired with Tesla's vehicles remains the best way to travel the roads of the world, as no other vehicle has a charging network that comes even remotely close to the utopia of Tesla's 11,000+ charge point Supercharging network.

[See more photos at the URL below.]

<https://cleantechnica.com/2018/12/22/how-tesla-model-3-compares-to-tesla-model-s-on-2400-mile-road-trip/>



Colorado Adopts California Auto GHG Limits, Rebuking Trump Rollback Plan

From: *Inside Cal/EPA*

An exclusive weekly report on environmental legislation, regulation and litigation from the publishers of Inside EPA
Vol. 29, No. 46 — November 23, 2018

By Dawn Reeves

Colorado officials are adopting California's greenhouse gas and other emission limits for light-duty vehicles, issuing a formal rebuke to the Trump administration's proposal to freeze Obama-era GHG and fuel economy limits and revoke the Golden State's ability to impose tougher standards.

The state's Nov. 16 adoption of the so-called low emission vehicle (LEV) rule under outgoing Gov. John Hickenlooper (D) also tees up the possibility that it will consider adopting California's zero emission vehicle (ZEV) sales mandate next year under the administration of Gov.-elect Jared Polis (D), who prevailed over his GOP challenger in this month's midterms. Relevant documents are available on InsideEPA.com. (Doc. ID: 216940) Colorado would be the tenth state to adopt the ZEV program, joining Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island and Vermont. Those that have adopted the LEV rules include all of the ZEV states plus Delaware, Pennsylvania, Washington and the District of Columbia.

The Colorado Air Quality Commission on Nov. 16 adopted the Colorado Low-Emission Automobile Regulation (CLEAR) after two days of public hearings. It takes effect in model year 2022. At the start of the hearing Nov. 15, commissioners said that only the LEV rule is on the table, "reminding all this is not about ZEV," says one source who attended the hearing.

Hickenlooper in a statement notes that if U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) roll back their standards for MY21-26, that would "make it harder for Colorado to meet its clean air goals. Although the proposed federal rollback is not yet final, the adoption of CLEAR provides a cost-effective and sensible backstop for Colorado in the event of a federal rollback."

Opponents argued at the hearing that the rule would cost consumers more in Colorado than it does in California, in part because of the state's more rugged terrain. The Colorado Automobile Dealers Association said it would raise the price of an average car by \$2,100.

But environmentalists say drivers will reap \$2,700 in fuel savings due to the standards, more than offsetting any initial price increase.

State officials say in a presentation that the rule's goal is "to maintain the existing [GHG] standards applicable to light- and medium-duty new vehicles," and that adopting CLEAR "avoids the roll-back of existing standards currently proposed by the federal government" as well as "prevents the massive increase in GHG emissions from Colorado's new vehicle fleet that would occur from the roll-back."

Under the federal proposal, EPA and NHTSA would freeze requirements at MY20 levels, while also scrapping

California's unique Clean Air Act authority to set its own GHG limits as well as revoke the ZEV program. However, there are signs that White House and California officials are negotiating on changes to the rules that might avoid protracted litigation.

California's GHG standards are currently aligned with the Obama limits, and it has said it would continue enforcing those rules amid a federal rollback. In that scenario, Colorado's LEV adoption would expand the percentage of the new vehicle market that would fall under the stricter set of requirements, which is already at one-third of the national market.

The Colorado Auto Dealers Association says in its presentation that the state rule is a "bad idea" and that Colorado is different from California because its residents drive more sport utility vehicles, minivans and trucks, they drive more in rural settings and the state has "a more rugged geography, higher altitude and colder climate than California."

'Substantial Net Savings'

A coalition of environmental groups presented expert testimony from Chet France, who is the former director of assessment and standards at EPA's Office of Transportation & Air Quality and is now a consultant for the Environmental Defense Fund.

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US Senators Propose National Zero-Emission Vehicle Mandate

By Charles Morris

Senators Jeff Merkley (D-OR) and Sheldon Whitehouse (D-RI) have introduced a bill that would require auto manufacturers to make zero-emission vehicles (ZEVs) 50% of new car sales by 2030, and 100% of sales by 2040.

Zero-Emissions Vehicle Act of 2018

[<https://www.congress.gov/bill/115th-congress/senate-bill/3664>] has been referred to the Senate Committee on Environment and Public Works. Few details have been made public so far, but according to advocacy group *Plug In America*, the bill includes a mechanism by which automakers that cannot achieve compliance can purchase credits from other firms (as does the existing mandate in force in California, which once provided some nice extra income for Tesla). Revenue from the sale of ZEV credits would help support public infrastructure through the Highway Trust Fund.

“This is a huge step in the right



direction for America’s transportation policy,” said Joel Levin, Executive Director of Plug In America. “The 10 states that have already adopted a ZEV mandate are leading the way in electric vehicle adoption. A national ZEV mandate would send a huge signal to automakers and consumers that the future of transportation is electric, and would significantly accelerate the

adoption of EVs across the country.”

“The growth of the EV sector promotes jobs in the US in the fields of technology and innovation, and keeps us competitive with countries like China,” continued Levin. “Not only this, but EVs provide cleaner air, reduce our reliance on foreign oil, and reduce carbon emissions.”

<https://chargedevs.com/newswire/us-senators-propose-national-zero-emission-vehicle-mandate/>



CO Environmental Legislation *continued from page 22*

France blasted EPA’s proposed rollback as dramatically overstating the costs and understating fuel savings of the Obama-era rules, and noted that every other recent analysis of the existing federal standards finds they will “deliver substantial net savings for American drivers.” He also said the Colorado rule will “save Coloradans money and lead to significant reductions in GHG emissions,” and that it “will provide important criteria and air toxics emissions reductions.”

The state’s move to adopt the rule amid EPA’s rollback effort makes it a microcosm of the national fight. National automaker groups are weighing in against the proposal as premature while also stressing support for cleaner cars.

Colorado has also signaled its intent to begin a separate proceeding as soon as next month to consider adopting the ZEV program, even as EPA seeks to revoke it. The state’s adoption of it is considered much more likely with Polis’ election. The fight over the adoption of that rule is likely to be more intense because automakers have long chafed at the ZEV sales mandates.

Published on November 19

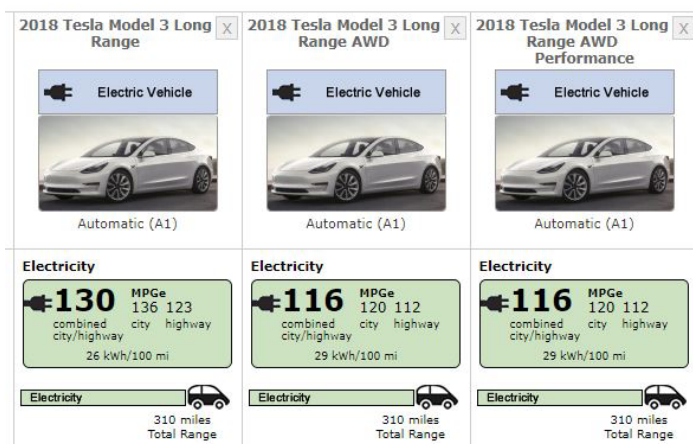
<https://insideepa.com/daily-news/colorado-adopts-california-auto-ghg-limits-rebuking-trump-rollback-plan>

And on 11/29/2018

<https://environmentalnewsstand.com/newsletters/clean-air-report>



How The EPA Rates Electric Cars: Range, Efficiency & More



By Jim Gorzelany

IT'S ALL ABOUT RANGE, KWH/100 MI, AND MPGE.

As with conventionally powered models, electric vehicles are rated for their energy efficiency – and in this case their operating range on a charge – by the Environmental Protection Agency. If you're already an EV owner, you probably have noticed that your power consumption and/or range doesn't always jibe with its official ratings. As automakers usually say in ads that reference a vehicle's fuel economy, "your mileage may vary."

A big reason for this is the manner in which vehicles are tested. Contrary to what you might expect, they're not driven on the open road. Rather, a vehicle's energy consumption is determined in a laboratory using a standardized procedure that's mandated by federal law.

TEST PROCEDURES

Each vehicle tested is "driven" on a device called a dynamometer. Think of it as a treadmill for cars. While the engine and transmission drive the wheels, the vehicle never moves, just the rollers upon which the wheels are placed.

A professional driver runs the vehicle through multiple standardized driving schedules to simulate city and highway motoring. The basic city-driving program replicates a rush-hour stop-and-go driving experience with frequent idling. The highway circuit is designed to emulate rural and interstate freeway driving at higher speeds, without making any stops.

An electric vehicle is tested after being parked overnight, and with the battery fully charged. It's then operated through successive city or highway driving cycles until the battery becomes depleted. It's then brought back to a full charge. A technician determines the vehicle's energy consumption by dividing the kilowatt-hours of energy needed to replenish the battery by the number of miles driven. The latter is also used to determine an EV's estimated operating range on a charge.

To help consumers compare the energy consumption of electric cars with those that run on fossil fuel, the EPA created a miles-per-gallon equivalent measurement, called "MPGe." This is calculated based on a conversion factor of 33.705 kilowatt-hours of electricity equaling one gallon of gasoline.

For 2018, the EPA's most energy-efficient EV is the Hyundai Ioniq Electric, with a rating of 150 MPGe in city driving and 122 on the highway. The next-highest 2018 models are the Tesla Model 3 Long Range at 136/123 MPGe, the Chevrolet Bolt EV at 128/110 MPGe, and the Volkswagen e-Golf at 126/111 MPGe.

FUDGE FACTORS

Unfortunately, there are elements inherent in the EPA's testing procedures that tend to skew the ratings. For starters, vehicles are tested without a full load of passengers, cargo and options aboard. All else being equal, the heavier a vehicle's rolling weight, the more energy is needed to reach and maintain a given speed.

Also, the tests are conducted indoors at room temperature. An electric car's range tends to suffer when subjected to extremely cold or hot weather. This is both because of the adverse effects of high and low temperatures on a battery's charge, and the drain caused by operating the heater and air conditioning.

What's more, a given motorist's driving habits can also affect an EV's energy consumption. Lead-footed acceleration and driving at higher speeds will tend to drain the battery faster than will maintaining a smooth and steady pace. Driving on under-inflated tires will also cost an EV owner additional kilowatt-hours of electricity.

continued on page 25

READING AN EV'S 'FUEL ECONOMY' STICKER

The federal government requires automakers to include information on a vehicle's energy consumption, along with pricing and other information on the so-called "Monroney" sticker that's posted on every new light-duty vehicle sold in the U.S. It's named for Almer Stillwell "Mike" Monroney, a U.S. Senator from Oklahoma who sponsored the Automobile Disclosure Act of 1958 that mandated the use of price stickers.

In the case of electric vehicles, the Monroney sticker prominently displays the MPGe estimates for city, highway and combined city/highway driving. The latter assumes 55 percent city driving and 45 percent on the highway. The sticker also shows the number of kilowatt-hours of electricity that's needed to run the vehicle for 100 miles (this is expressed as kWh/100 mi). The EPA says this measurement is actually more meaningful when comparing costs and energy consumption between EVs than the MPGe rating.

The sticker also notes, on average, how many miles the vehicle can operate on a charge, and how long it takes to fully replenish a discharged battery using a 240-volt (Level 2) charger. You can expect the time to typically double when using a standard household outlet.

The window sticker further notes the energy consumption

range for other models in the vehicle's size class. You'll also find the average annual cost to keep the car or truck running, based on 15,000 miles driven at a predetermined price per kilowatt-hour for electricity. It also shows how much more or less that amount is compared to the average vehicle over a five-year ownership period. These numbers will of course, differ for a given driver depending on local energy rates.

The sticker also provides ratings on a 1-10 basis for a vehicle's smog-related tailpipe emissions and greenhouse gas emissions. Since full electric vehicles produce neither of these they automatically receive a rating of 10.

You'll also find a "QR" code that can be scanned by a smartphone and takes users to a website where they can enter information about their commutes and driving habits to get a better estimate of their energy consumption and costs.

The above information can also be found on the EPA's [fueleconomy.gov](https://www.epa.gov/fueleconomy) website for easy comparison among competing models, and it's available for all current and past plug-in and conventionally powered vehicles.

Be sure to check out other helpful information on electric vehicles here on MYEV.com, which is also the Internet's prime – and free – marketplace for buying and selling EVs.

<https://insideevs.com/how-epa-rates-electric-cars-range-efficiency/>



Final Update: November 2018 U.S. Plug-In EV Sales Report Card

By Steven Loveday

Nov. U.S. plug-in EV sales will climb again, but how high?

November 2018 will mark the 38th month of consecutive year-over-year monthly sales gains for plug-in vehicles.

Each month InsideEVs tracks all plug-in EV sales/deliveries for the United States by automaker. The last four consecutive months are now the top four best-selling months of all time. In addition, March 2018 completes the list, meaning all five top months have happened this year. We have no doubt November will make the list, but where will it fit in? Is there a chance it could shoot to the top?

September's results will be tough to beat since it's



so far ahead of the others. Perhaps we'll have to wait for December U.S. EV sales to crown a new champion? But, that doesn't mean that November sales won't be top-notch!

[Read the rest of the article, and review estimates and methodology at the URL below]



<https://insideevs.com/november-2018-u-s-plug-in-ev-sales-report-card/>

VW's Electrify America Opens California's First 350Kw Ultra-Fast Charger, Before Cars Can Actually Use It



Photo: Electrify America

By Jameson Dow

Recently, Electrify America opened California's first 350kW quick charge location. The bank of chargers includes nine CCS plugs and one CCS-CHAdEMO plug, and while most of them have an already-quick 150kW rate, two CCS plugs are capable of ultra-fast 350kW charging.

The charger is installed at the San Francisco Premium Outlets in Livermore, CA, which also happens to be a **Tesla Supercharger** location. Tesla's website states that the chargers there can charge at up to 120kW, though they're the "urban" type supercharger and owners have clocked them maxing out at 72kW.

Electrify America is an organization formed by VW in the wake of the "dieselgate" scandal in response to a settlement with the EPA and CARB requiring them to invest \$2 billion in EV projects in the US. The organization will be installing quick chargers across the US and running ad campaigns encouraging electric vehicle adoption.

The 350kW charging standard uses 800 volts, as opposed to the standard EV battery which is around 400 volts, though no cars currently shipping are capable of charging at such a fast rate. Some announced cars, namely the Porsche Taycan (and the Audi e-tron GT based on the same platform), will have this capability.

VW group's other upcoming EV, the Audi e-tron SUV, will be limited to charging at 150kW – which is still plenty quick. Fred is currently on a press event doing some test drives of the e-tron SUV, so stay tuned to hear all about that car's off-road capabilities soon.

A map of all of Electrify America's planned and active charging locations is available below:

<https://www.electrifyamerica.com/locate-charger>
<https://www.electrifyamerica.com>

<https://electrek.co/2018/12/06/electrify-america-first-350kw-charger-california/>

Turnpike To Install Electric Vehicle Charging Station



(Photo: Electrify America)

By Jon Stinchcomb

The Ohio Turnpike is taking steps to go green and drivers doing the same in Northwest Ohio could be among the first to get the chance to take advantage.

Electrify America and the Ohio Turnpike and Infrastructure Commission have announced plans to install the Ohio Turnpike's first electric vehicle charging stations.

"This collaboration with the Ohio Turnpike is a key element to creating cross-country routes with ultra-fast chargers," said Brendan Jones, chief operating officer of Electrify America.

The charging stations will be located at the Wyandot and Blue Heron Services Plaza locations between Genoa and Elmore, as well as at the Indian Meadow and Tiffin River Service Plazas in West Unity.

Those locations are expected to be where electric vehicle demand is projected to be the most significant in the near-term, the release stated.

"This is yet another example of Ohio staying ahead of the curve and preparing our state for the future of transportation," said Randy Cole, executive director of the Ohio Turnpike.

According to a report from the Ohio Turnpike and Infrastructure Commission, with auto manufacturers having committed \$92 billion to new electric vehicle production plans, more turnpike drivers are expected to be in need of a charging infrastructure.

In 2017, a total of 55.2 million vehicles used the Ohio Turnpike.

"Our modern service plazas are the perfect place for these new charging stations, allowing customers to charge their car up quickly, grab a bite to eat or cup of coffee and get back on their way," Cole said.

Electrify America, based in Reston, Virginia, is a company developing electric vehicle charging infrastructure across the country. The stations along the Ohio Turnpike will have four charging dispensers offering 150 to 350 kilowatts of power.

According to the company, they are installing a total of more than 4,800 charging dispensers nationwide, with sites under construction by June 2019.

"(Electric vehicle) drivers need fast, reliable and convenient charging access in order to travel about the country," Jones said.

<https://www.portclintonnews herald.com/story/news/local/2018/11/04/ohio-turnpike-plazas-feature-electric-vehicle-charging-station/1859834002/>

Rhode Island Public Transit Authority Unveils Electric Buses

By Betsy Lillian

Using Volkswagen Dieselgate settlement funds, the Rhode Island Public Transit Authority (RIPTA) is testing out three 40-foot Proterra Catalyst E2 electric buses.

Recently, RIPTA unveiled the leased buses at a press conference with Rhode Island Gov. Gina Raimondo and the Rhode Island Department of Environmental Management. In total, the state received \$14.4 million in VW funding and chose to invest the bulk of it in clean transit, with the intent to replace approximately 20 retiring diesel buses with all-electric, zero-emission vehicles. This deployment marks the first step toward achieving this goal, says Proterra.

Read more at the URL below.



<https://ngtnews.com/rhode-island-public-transit-authority-unveils-electric-buses>

Metro Transit Plans to Shift Bus Fleet to All-Electric

Council taking tentative steps spurred by opening of new C Line rapid bus service in 2019.

By Janet Moore, Minneapolis

Metro Transit took a bold step recently with plans to one day have all of its buses powered by electricity, joining other cities across the country making the move away from diesel fuel.

“It’s an aspirational goal, but we think this plan is set up to be fully successful,” Brian Funk, Metro Transit’s deputy chief operating officer for bus said at Monday’s Metropolitan Council Transportation Committee meeting.

About 60 people packed the committee meeting to applaud the council’s plan to go all-electric — provided operational details can be worked out, including where charging stations will be located, and how the buses will operate in a cold climate. [Read the rest of the story at the URL below.]



A route 3 bus on the University of Minnesota campus Monday Tuesday afternoon.
Jeff Wheeler – Star Tribune

<http://www.startribune.com/metro-transit-plans-to-shift-bus-fleet-to-all-electric/502414551/>

FedEx Adding 1,000 Chanje Vans to Electrify its Fleet

By Kirsten Korosec

FedEx is turning to a relatively new and unknown startup as it ramps up its efforts to electrify its fleet of delivery vans. The company announced Tuesday plans to add 1,000 electric delivery vehicles from Chanje Energy, a California-based and China-backed startup founded in 2015.

FedEx is purchasing 100 of the vehicles from Chanje Energy. It will lease the remaining 900 Chanje vehicles from Ryder System. The purpose-built electric vehicles will be delivered on a rolling basis over the next two years.

The vans, which can travel more than 150 miles when fully charged, will be used by FedEx Express for commercial and residential pick-up and delivery services in California.

Chanje's roots grew out of Smith Electric Vehicles, a now defunct electric-truck company based in Kansas City. Chanje was originally meant to be joint venture between Smith and FDG Electric Vehicles. Smith no longer operates and Chanje, led by Smith's former CEO Bryan Hansel, has gone on to grow.

Chanje, which is targeting last-mile delivery and energy (or charging) services, has a strategic partnership with Hong Kong-based FDG.

Chanje's vans are being manufactured by FDG in Hangzhou, China; the startup's headquarters are in Los Angeles and has some operations in Kansas City. Eventually, Chanje has plans to open an assembly plant in the U.S. The company hasn't determined a location yet.

FedEx has been using EVs as part of part of its pickup-and-delivery fleet



since 2009; and its sustainability goal promises that it will continue to add more. The company has a goal to increase vehicle fuel efficiency 50 percent from a 2005 baseline by 2025.

fuel, electric and hybrid-electric vehicles at the end of 2017. The EVs have the potential to help FedEx save 2,000 gallons of fuel while avoiding 20 tons of emissions per vehicle each year, according to the companies.

FedEx had more than 2,860 alternative-

<https://techcrunch.com/2018/11/20/fedex-is-adding-1000-chanje-vans-to-electrify-its-fleet/>

The Vans Will Be Built In China But Will Operate In California

[More information about FedEx Plans]



Stephen Edelstein writes for *The Drive* about the agreement between FedEx and Chanje.

FedEx expects to save two thousand gallons of fuel and eliminate 20 tons

of carbon emissions per vehicle each year by going electric. These vans have a claimed 150-mile range and 6,000-pound cargo capacity. Read more below.

<http://www.thedrive.com/news/25022/fedex-orders-1000-electric-delivery-vans-from-startup-chanje>

Rivian Launches World's First Electric Adventure Vehicles™ With Debut of R1T Pickup



R1T R1T Beach



R1t Front End Charge Indicator

Rivian, an electric vehicle manufacturer, has released information about the first of its two Electric Adventure Vehicles™ the R1T™, an all-electric, 5-passenger pickup. The automaker introduced its fully electric SUV – the R1S™ and the R1T to the public on Nov. 27, at AutoMobility LA.

The highly anticipated truck features a range of up to 400+ miles, a wading depth of 1 meter, and the performance and precise control of quad-motor AWD and has been developed to help customers get out and explore the world. The R1T and R1S will be produced at Rivian's manufacturing plant in Normal IL, from late 2020.

“We’re launching Rivian with two vehicles that reimagine the pickup and SUV segments,” said Rivian Founder and CEO RJ Scaringe. “I started Rivian to deliver products that the world didn’t already have – to redefine expectations through the application of technology and innovation. Starting with a clean sheet, we have spent years developing the technology to deliver the ideal vehicle for active customers. This means having great driving dynamics on any surface on- or off-road, providing cargo solutions to easily store any type of gear, whether it’s a surf board or a fishing rod and, very importantly, being capable of driving long distances on a single charge. From the inside out, Rivian has developed its vehicles with adventurers at the core of every design and engineering decision. The R1T and R1S are the result of all this work and we are excited to finally introduce these products to the world.”

Skateboard Platform

The foundation of the R1T and R1S is Rivian's skateboard platform, which efficiently packages the battery pack, drive



Rivian Skateboard Platform

units, suspension, braking and thermal system all below the height of the wheel, leaving the space above for occupants and their gear.

Beyond the packaging benefits, this architecture delivers a low center of gravity that supports the vehicle's agility and stability. Adding to these inertial advantages is a sophisticated suspension architecture with unequal length double wishbone suspension in the front and a multi-link suspension in the rear. The suspension features dynamic roll control and adaptive dampers along with ride-height adjustable air-suspension – allowing the suspension to be adjusted for highway comfort, on-road performance or off-road capability.

Rivian's vehicles also feature a quad-motor system that delivers 147kW with precise torque control to each wheel, enabling active torque vectoring and maximum performance in every situation, from high-speed cornering to low-speed rock crawling. With 3,500 Nm of grounded torque per wheel

continued next page

(14,000 Nm of torque for the full vehicle), the R1T can reach 60 mph in 3 seconds and 100 mph in less than seven seconds. This powertrain and chassis also enable the R1T's tow rating of 11,000 pounds.

“The beauty and elegance of our quad-motor setup isn't just about brute power; this architecture provides instantaneous torque with extremely precise control at each wheel, which is completely game-changing from a dynamics perspective, both on- and off-road,” said Executive Director of Engineering and Programs Mark Vinnels.

Design Exterior

Rivian's vehicles have been designed to communicate strength and refinement while still inviting customers to get them dirty. Strong proportions and clean, continuous bodylines help the vehicles achieve a modern, inviting stance while acknowledging the performance and level of technology integrated into the vehicle.

The main bodyline of the R1T wraps up and around the cab and gives the vehicle a distinctive silhouette, while highlighting the Gear Tunnel™ cutline and accentuating the rear fender flares. The R1T features short overhangs, high ground clearance and aggressive approach and departure angles for a confident and rugged stance, all enabled by Rivian's unique skateboard platform. A Rivian will be quickly recognized, with its iconic, signature “stadium” headlights and a daytime running light that extends the entire width of the vehicle.

Design Interior

In harmony with the exterior, the interior of Rivian's vehicles welcomes occupants into a premium environment that conveys craftsmanship yet invites rugged, daily use. Color and materials play an important role in differentiating Rivian vehicles. Sustainably sourced wood is used throughout the interior and its natural finish contributes to a warm and inviting feel. The most striking use of wood is as a structural element in the dash that integrates the main center display and driver cluster, integrating form and function beautifully. In the high-wear areas of the interior, the materials take inspiration from sportswear and active gear, combining durable and innovative materials that can easily be cleaned.

“Although the exterior of the vehicle is what first attracts you, the interior is where you spend the most of your time, so we really focused on creating a transformational space,” said VP of Vehicle Design Jeff Hammoud. “The biggest challenge was creating an interior design that delivered



RIVIAN R1T Interior Cutaway



RIVIAN R1T Interior Front



RIVIAN R1T Rear Bin No Spare

a premium experience, while still being comfortable as a space that is heavily used. To do this, we looked outside the automotive industry and took inspiration from contemporary furniture, as well as hiking and outdoor gear, to drive the design.”

[For more technical info and videos go to the URL below.]

https://media.rivian.com/photo_gallery/r1t/

Rivian R1S Electric SUV Goes Family Style with Seven Seats, 410-mile Range

Two years from now, the electric-vehicle startup Rivian hopes to be making its R1T electric pickup truck at a former Mitsubishi (and Chrysler) plant in Normal, Illinois.

If everything goes according to plan, shortly after that, in early 2021, it will start to deliver its other so-called electric adventure vehicle: the R1S all-electric seven-passenger SUV.

With the R1S, which Rivian has just previewed at the LA auto show, much is carried over from its also-hypothetical R1T – including the three model levels attached to 105-kWh, 135-kWh, and 180-kWh battery packs, with four motors, rated up to 174 hp depending on the version. And from them should come the same exceptional 820 pound-feet of torque – and acceleration times of less than 7.0 seconds to 100 mph for the quickest version and a top speed of 125 mph for all.

Rivian anticipates 10 more miles of range over the pickup – so 410 miles or more from the top 180-kWh version. It even pegs the base 105-kWh, which it says will be available six months after launch, providing 240 miles of range or more. The CCS DC fast charging is at a rate that should fit these huge battery packs; with DC fast charging at 160 kW, it can gain 200 miles in 30 minutes.

Although the R1S has essentially the same height and width as the R1T, it rides on a shorter-wheelbase (121.1-inch) and has a 198.4-inch total length – about exactly the length of the Ford Explorer.

The R1S would have the same 14.4 inches of ground clearance and



R1S all-electric seven-passenger SUV



R1S interior cutaway

water fording depth of 29.4 inches. Adaptive dampers and an adjustable air suspension should help it ride comfortably in a range of environments.

Rivian projects that it'll weigh about 44 lbs less than the pickup – 5830 lbs for its curb weight. Max towing is 7,700, as opposed for 11,000 for the pickup.

The cabin appears to be a space that would configure well for family duty and possibly fit right in with Honda Pilots, Ford Explorers, and Subaru Ascents. There are two bucket seats in front, a three-place contoured bench seat in the second row, and a smaller two-place bench in the third row.

continued next page

RIVIAN R1S

As with many third-row vehicles, its position looks elevated and might not be comfortable for adults—but it definitely looks better than the makeshift third-row positions in a Tesla Model X. We'll have to assume seat folding is per the SUV norm, and Rivian confirms there will be a 'frunk.'

The dash is a more conventional alternative to Tesla, but brings more to the touch screen, apparently, than most other current vehicles. The dash layout has a warm, wood-trimmed look, with a very large, horizontally oriented tablet interface, and what looks to be a colorful, reconfigurable dash cluster divided into three viewing segments.

Rivian intends to launch the R1S (and the R1T) with Level 3 autonomous-driving hardware – meaning that a hardware suite, including lidar and



R1S Front interior

radar, will provide hands-off, eyes-off driving in highway situations.

Beyond Level 3, the company makes a statement that could be interpreted in

many ways, that “the vehicle will have a range of self-driving features focused on enabling active lifestyles.” It’s a statement that could be interpreted in many ways.

https://www.greencarreports.com/news/1120109_rivian-r1s-electric-suv-goes-family-style-with-7-seats-410-mile-range

Automotive Startup Rivian Unveils an Electric Truck and SUV

[This article presents another take on these two vehicles. There are other photos to view as well.]

By Roberto Baldwin

Electrified SUVs are popping up everywhere. So it's no surprise that automotive startup Rivian has unveiled one of its own, the R1S. More exciting is the company's electron-powered pickup truck, the R1T.

The automaker calls both vehicles Electric Adventure Vehicles. The idea is that both can handle the rigors of the average day and are also ready to go off-road and tackle the elements when needed. If the specs work out the way the company hopes they will, there's a good chance these vehicles could deliver on the company's promise.

According to Rivian, the R1T will have up to a 400-mile range, will do zero to 60 in three seconds, support over-the-air updates, seat five and have a four-motor AWD drivetrain. When it initially ships in late 2020, the truck will be available with either a 180kWh or 136kWh battery pack. Later, a 105kWh battery will be available.

Rivian says that the R1S SUV will be delivered in 2021 and



that both vehicles will ship with Level 3 autonomy (the vehicle will drive itself in certain circumstances, probably on the highway). All of this is impressive, but it takes more than promises for a new company to deliver a vehicle. Especially at scale. Just ask Tesla.

If Rivian can pull this off, the next time you hassle a friend to help you move, your Ikea furniture, clothes and boxes of old smartphones might be hauled by an electric truck.

<https://www.engadget.com/2018/11/27/rivian-electric-truck-suv-r1s/>

2020 Kia Soul Gets Funkier and Adds a Long-range Soul EV



2020 Kia Soul EV Image Credit: Drew Phillips

Choose from naturally aspirated, turbo or electric power

By Joel Stocksdales

The Kia Soul, the clear victor of the funky box fad of the mid-2000s, has been completely redesigned for the 2020 model year. It's still very square, but it's even funkier than before. The big, cute headlights of previous models have been swapped for a more futuristic, almost brooding set of slender lamps up top connected by a piece of plastic for a full-width look. They're supplemented by additional lights in large pods in the front bumper. There's a large grille in the bottom of the bumper, too. The overall nose is a bit more rounded, but the whole profile is about as upright as ever. The rear is completely vertical and retains vertical taillights that now have a wraparound look. The fenders don't visually protrude as much, but they're highlighted by deep creases around the wheel arches.

There are an array of trims to pick from on the new Soul, some of which have significant style tweaks. LX, S and EX make up the basic Soul, with an EX Designer Edition offering up two-tone paint between the roof and body as well as big 18-inch wheels. The Kia Soul Turbo is replaced by the Soul GT-Line, which can be had with the turbo engine or the naturally aspirated engine. It has a much more aggressive front fascia with extra slots around the grille and side sill extensions with red accents. The turbo version gets center-exit exhaust, bigger brakes and stiffer suspension. Then there's the new X-Line that gives the Soul a crossover look with plastic body cladding, fender flares and fog lights. It also has two-tone paint as an option.

Despite all the design changes, the new Soul is almost exactly the same size as

the old one. It's just over 2 inches longer, and adds a little over an inch between the wheels, but width and height are the same. Passenger space is nearly the same, too, giving or taking a couple tenths of an inch here and there. There is much more cargo space now, though, picking up an extra five cubic feet for a total of 23.8. The restyled interior also gets some nice new features such as customizable ambient lighting, an available 10.25-inch touchscreen and a heads-up display.

This all brings us to the Soul EV, which is now the hottest version of the little hatchback. It takes its electric motor and battery pack from the Niro EV [1] and Kona Electric [2]. That means it has 201 horsepower like the turbocharged model, but a whole lot more torque at

continued next page

KIA SOUL EV

291 pound-feet. That's a huge increase over the 109 horsepower and 210 pound-feet of torque of the outgoing model. The battery is 64 kWh in capacity. Range hasn't been announced, but it should at least be over 200 miles, since the Kona Electric has a range of 258 miles with the same battery.

DC fast charging will be a standard feature, as will variable regenerative braking strength that's adjustable via steering wheel paddles. The Soul EV will also have four driving modes including Eco, Eco+, Comfort and Sport. Each mode adjusts motor output, regenerative braking, climate control settings and can implement speed limits.

The EV has a number of other unique qualities. It has its own special 17-inch alloy wheels and a front fascia with most of the lower grille closed off. Two versions are available, Soul EV, and Soul EV Designer Collection. The latter adds a few special two-tone paint schemes for the EV including grey with gold top, black with a red top and blue with a black top. The standard Soul EV is well-equipped with the 10.25-inch touchscreen as a standard feature across the board along with forward collision prevention, lane-keeping assist, adaptive cruise control with stop-and-go capability — though the EV Designer Collection ups the ante with a leatherette steering wheel and upholstery, 10-speaker audio system, heated seats and wireless phone charging.

The Soul EV is more broadly targeted for sometime in 2019. Pricing will come out close to the on-sale dates. [Read the rest of the story below.]



2020 Kia Soul EV Image
Credit: Drew Phillips



2020 Kia Soul EV Image
Credit: Drew Phillips



2020 Kia Soul EV Image
Credit: Drew Phillips

[1] <https://www.autoblog.com/2018/06/07/kia-niro-ev-revealed-korea/>

[2] <https://www.autoblog.com/2018/10/16/2019-hyundai-kona-electric-review-first-drive/>

Keep Up on all Auto Shows & EV Related Conferences

US and International Events

**SAN DIEGO INTERNATIONAL
AUTO SHOW 12/27/18 - 12/30/18**

**NEW ENGLAND INTERNATIONAL AUTO
SHOW 01/17/19 - 01/21/19**

**PENNSYLVANIA AUTO SHOW
01/24/19 - 01/27/19**

**PHILADELPHIA INTERNATIONAL AUTO
SHOW 02/02/19 - 02/10/19**

**MOTOR TREND INTERNATIONAL AUTO
SHOW - BALTIMORE
02/07/19 - 02/10/19**

**NORTHEAST INTERNATIONAL AUTO
SHOW 02/08/19 - 02/10/19**

**PITTSBURGH INTERNATIONAL AUTO
SHOW 02/15/19 - 02/18/19**

**SILICON VALLEY INTERNATIONAL
AUTO SHOW SAN JOSÉ 03/07-03/10/19**

**AMELIA ISLAND CONOURS
D'ELEGANCE 03/08/19 - 03/10/19**

**WASHINGTON AUTO SHOW
04/05/19 - 04/14/19**

**WASHINGTON AUTO SHOW
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**NEW MEXICO INTERNATIONAL AUTO
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**NEW ENGLAND INTERNATIONAL
AUTOSHOW**

JANUARY 17-21, 2019
BOSTON CONVENTION & EXHIBITION CENTER

PRESS PREVIEW

The 2019 New England International Auto Show press day will take place on **Thursday, January 17, from 10:30 AM - 4:00 PM**. The show will open to the public at 4:00 PM.

To schedule a presentation or obtain press day credentials, please contact **Chris Russell** at 781-343-1661 or crussell@paragonexpo.com.

JANUARY 17-21, 2019
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<https://www.bostonautoshow.com/>



12/27/18 - 12/30/18



<https://visitsandiego.com/2018/10/san-diego-convention-center-wins-best-west>



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FEBRUARY 2 - 10, 2019

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BLACK TIE TAILGATE





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BLACK TIE TAILGATE

2019 PHILADELPHIA AUTO SHOW
**BLACK TIE
TAILGATE**
2.01.19
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<http://www.phillyautoshow.com>



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

The Th!nk City is a Tiny Electric Car



It's rather unusual to find a review of this car, and in the used market today – they can be purchased inexpensively. The car provides adequate local transportation in an analog fashion with just about what everyone needs: P/S: Power windows, plenty of room for groceries, A/C and a heater that works well because the cabin is so very small – there's not much air to heat up. 50 miles range year round is pretty predictable. Charging is accomplished with a standard J-1772 plug at 120 or 240 volts: after 40 miles it takes about 3.5 hours to recover that on Level 2. The L1 EVSE is included. Because of the short wheelbase, the ride is rather bumpy, but it's not good for cross country travels, or frequent freeway trips either. It could be hauled in the bed of a full sized p/u truck.

<https://www.youtube.com/watch?v=kn1gMnvFJIY>

Model 3 Surprise



Watch us surprise Tesla owners in Germany. One owner claims, "I'm really looking forward to Model 3." Another says, "I think the Model 3 will be a more day-to-day use car." "A couple expresses their approval by claiming, "I think this is the answer that we should follow everywhere."

https://youtu.be/e_Wnwb_cC3g

Rivian R1T First Look: Trucks Go Electric



Rivian's R1T is an electric pickup truck that promises off-road driving, more than 5000Kg of towing capacity, and a 400 mile range. We got to take a closer look at the LA Auto Show.

<https://www.youtube.com/watch?v=MGFr2TgLAGQ>

Chevrolet Bolt EV High Voltage Components



This vehicle breakdown video by Professor John D. Kelly at Weber State University (Utah) nicely covers key components as well as design considerations on the 2017 Bolt EV. The page provides time stamps for the various topics over the 36 minutes for future quick reference. There are other videos he has produced as well, on the motor and the rest of the Bolt EV. Search YouTube for links.

https://www.youtube.com/watch?v=5gDILvW5yMg&fbclid=IwAR253cC5XMCwFm8xRhT1Hxahus1ZWPEq_

More Articles of Interest (cont.)

The Electric Airplane Revolution May Come Sooner Than You Think

Eviation's Alice is an all-electric, nine-person aircraft that may help replace fossil fuel-burning commuter planes.

By Rohit Jaggi

An all-electric mini-airliner that can go 621 miles on one charge and replace many of the turboprops and light jets in use now—flying almost as far and almost as fast but for a fraction of the running costs—could be in service within three years. But this isn't another claim by another overoptimistic purveyor of electric dreams. It's using current technology, and the first planes are being built right now. In fact, the process of gaining certification from aviation regulators for what would be the world's first electric commuter plane has already started.

The pressurized Alice from the Israeli company Eviation is a graceful-looking composite aircraft with one propeller at the rear and another at the end of each wing, placed to cut drag from wingtip vortices. Each is driven by a 260 kW electric motor, that receive power from a 900 kWh lithium ion battery pack.


Alongside its 650 mile range, the pressurised \$3 million-plus Alice can carry nine passengers and two crew, and cruise at 276 mph – up there with the speed of the turboprops that are widely used in the commuter role, if not anywhere near that of jets. But crucially, says Eviation chief executive Omer Bar-Yohay, “operating costs will be just seven to nine cents per seat per mile,” or about \$200 an hour for the whole aircraft, against about \$1,000 for turboprop rivals.



An illustrious list of blue-chip companies has been assembled to support the project. The electric motors are from Siemens, the propellers from Hartzell, the avionics from BendixKing, and the fly-by-wire control system from Honeywell. The lithium-ion batteries are from Kokam, a South Korean company.

The company is currently building two aircraft and aims to have one flying early next year. A full-size plane will feature at the 2019 Paris air show (June 17 through 23) – a one-third demonstrator was at the French event last year. “Certification is expected in 2021,” says Bar-Yohay.

The benefits of electric aircraft are not just in slashed costs, pollution, and maintenance needs. Much quieter than jets, electric planes could open up city-centre airports to greater use. And the fact that the Alice has been designed

as optionally piloted opens up another area of cost saving – when the public is ready to take the step of flying without pilots sitting at the sharp end. 



Drawing from an extensive base of innovation in the fields of airframe design, battery technology and integration, advanced lightweight materials, thermal management and vehicle autonomy.

Photo: Eviation.

<https://robbreport.com/motors/aviation/eviation-alice-electric-airplane-revolution-sooner-than-you-think-2830522/>



Welcome to Membership in The Electric Auto Association!

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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.

Join Today!

www.electricaauto.org



Volvo Electric Truck Making Its Way to West Coast

By *Stephane Babcock*

Volvo Trucks will begin testing an all-electric truck with two California-based fleets in 2019, with plans to bring a truck based on the technology in Volvo's existing European FE Electric to the North American market by 2020.

The program, Volvo Low Impact Green Heavy Transport Solutions (Volvo LIGHTS), will involve 16 partners and deploy eight multi-configuration, battery-electric Class 8 demonstration units to Dependable Highway Express, a division of Dependable Supply Chain Services, based in Ontario, California, and National Freight Inc. (better known as NFI), at its operations in Chino, California.

"We see BEVs in the short-term future being utilized for drayage and dedicated routes. Since NFI's expertise is in dedicated contract carriage and drayage, we hope to provide valuable input into the BEV development process," said Bill Bliem, senior vice president, fleet services, NFI.

Early last year, NFI began exploring the reality of electric-powered Class 8 tractors, particularly for drayage operations. In October 2017, NFI acquired California Cartage Company, one of the largest port drayage companies in the country, expanding its drayage operations. Last November, Bliem and his team met with their primary OEM suppliers and asked to be involved in battery electric vehicle development and testing in exchange for their input.

"Protecting the earth by running zero-emissions vehicles will benefit everyone," said Bliem. "Once battery costs and weight decrease, BEVs' total cost of ownership should be at or below the [total cost of ownership] of a diesel tractor. With the subtraction of an internal combustion engine and transmission, the different levels of autonomy can be attained more efficiently as well."

Volvo LIGHTS will also integrate non-truck battery electric equipment, non-proprietary chargers, and solar energy production equipment. The goal is to eliminate an estimated 3.57 tons of air pollutants and 3,020 tons of greenhouse gases annually.

The project is part of California Climate Investments, a statewide initiative that aims to use cap-and-trade dollars to reduce greenhouse gas emissions while strengthening the state's economy and improving public health and the environment.



The first Volvo FE Electric, a refuse truck developed together with Europe's leading refuse collection bodybuilder, Faun, will start operating in the beginning of 2019 in Hamburg, Germany. The underlying technology will be used for a North American truck.
Photos: Volvo Trucks

"This is an excellent opportunity to show the end-to-end potential of electrification," said Peter Voorhoeve, president of Volvo Trucks North America. "From solar energy harvesting at our customer locations, to electric vehicle uptime services, to potential second uses for batteries, this project will provide invaluable experience and data for the whole value chain."

The project will deploy 23 Class 8 Volvo battery-electric trucks and 24 zero-emission forklifts, along with 58 heavy-duty fast chargers and other related equipment, in the California cities of Ontario, Chino, Fontana, and Placentia.

Funding for the demo project comes from the California Air Resources Board, which has preliminarily awarded \$44.8 million to the South Coast Air Quality Management District to fund the project.



Volvo Trucks plans to develop eight Class 8 electric trucks for use in California with technology based on the FE Electric Truck.

The first Volvo FE Electric, a refuse truck with a superstructure developed with European refuse collection bodybuilder Faun, will start operating in the beginning of 2019 in Hamburg, Germany. In addition, before the end of 2018, the first two refuse collection trucks in the Volvo FL Electric range will be entering regular operation in Gothenburg, Sweden.

[Read more below.]

<https://www.truckinginfo.com/319839/volvo-electric-truck-making-its-way-to-west-coast>



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EV COUNCIL OF OTTAWA

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VANCOUVER EVA

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MEXICO

EVA of SONORA (AVES)

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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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SAN JOSE EAA

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SILICON VALLEY EAA

Web site: www.eaasv.org
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COLORADO

DENVER ELECTRIC VEHICLE COUNCIL (DEVCC)

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NEVADA

EAA NORTHERN NEVADA

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LAS VEGAS EVA

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Elon Musk: Tesla to Double its Supercharger Capacity in 2019

By Yoni Heisler

Range Anxiety used to be a legitimate concern amongst prospective Tesla buyers. And with good reason, no one wants to find themselves stranded in the middle of nowhere with no charge left and not a charging station in sight. In an effort to address this concern, Tesla a few years ago astutely began rolling out a network of Supercharger stations wherein Tesla owners could charge up their vehicle in a relatively short amount of time.

In recent years, Tesla's Supercharger network has expanded considerably all across the globe. As a point of reference, Tesla in 2014 had put up a total 221 Supercharger stations. By 2018, the number of Supercharger stations jumped to 1,375. Still, Tesla has no intention of scaling back its rollout of Supercharger stations, especially in light of how many more Tesla vehicles are on the road these days thanks to the popularity of the Model 3.

In light of that, Tesla CEO Elon Musk recently said that the electric automaker has plans to significantly expand its Supercharger network. Taking to Twitter, Musk specifically noted that Tesla's Supercharger network will double by



Image Source:
Herman Caroon

the end of 2019. What's more, Musk said that 95% to 100% of people in "active markets" will be "within range" of a charging station next year. Per Tesla's website, the company now has 1,375 Supercharger stations across the globe with 11,414 individual Superchargers.

It's also worth noting that Tesla next year has plans to roll out a next-gen version of its Supercharger network that will be able to charge vehicles at a much faster clip.

Incidentally, with the number of Teslas on the road exploding, Tesla this year ended free charging for new Model S and Model X buyers.

<https://bgr.com/2018/11/22/tesla-supercharger-network-double-capacity-elon-musk-says/>



ARE YOU INTERESTED IN CHINESE EV HISTORY?

Below is an interesting link to some official history web pages on the EV effort mounted by the Chinese since 1995. Big auto assisted (GM, Toyota) and kept things moving.



<http://chinacarhistory.com/2018/10/16/a-brief-history-of-the-national-electric-vehicle-experimental-demonstration-area/>

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