

Electric Auto Association



# Current **E**vents

May 2019 Promoting the use of electric vehicles since 1967 Vol. 51 No. 5



**DEED 2019 - a huge success!**  
... page 10-17



**Kia Niro Review**  
... pages 21-25



**Home Charging Station Guide**  
... page 34

## Articles

- 1 **KARMA** — Is this a vision of its future?
- 3 **ENJOY SUMMER TRAVELS IN YOUR CLEANER FUELED ELECTRIC CAR** — and avoid high prices at the pump!
- 4 **THANK YOU TO OUR SUPPORTING MEMBERS**
- 5 **TAKE AN EV ROAD TRIP TO THE STUNNING SAN JUAN ISLANDS**
- 8 **BIPARTISAN BILL TO EXPAND ELECTRIC VEHICLE AND HYDROGEN FUEL CELL TAX CREDITS**
- 10 **FIRST ANNUAL DRIVE ELECTRIC EARTH DAY TALLIES 188 EVENTS** — Cities celebrate Coast to Coast
- 11 **PHOTOS TAKEN FROM VARIOUS DEED EVENTS ACROSS THE US**
- 17 **2019 ECOS PHOTOS** — Sacramento Event
- 18 **KARMA PRESENTS ITS ELECTRIC CAR VISION TO CHINA AND VIES FOR PARTNERS** — Karma automotive doesn't have just one vision for its future. It has three
- 21 **KIA NIRO EV – THE NEW NORMAL... ELECTRIC FAMILY CAR** — Kia Niro EV tested with the whole family and without a 240V home charger...
- 26 **ELECTRIC FORD BRONCO FROM ZERO LABS ENTERS THE RESTOMOD FRAY** — 190-mile range
- 29 **JAGUAR IS DEVELOPING A FULLY ELECTRIC CAR TO JOIN I-PACE CROSSOVER** — Plenty of life left in sedans
- 30 **2020 HYUNDAI IONIQ ELECTRIC GETS MORE RANGE & POWER, FASTER CHARGING – IN EUROPE**
- 32 **ENERGY FLOW CHARTS** — Energy, Water, and Carbon Informatics
- 33 **POWERLINE APPROVAL COULD BRING EV DRIVERS MORE WIND POWER** — Green new deal and EV advocates
- 34 **THE ULTIMATE ELECTRIC CAR CHARGER GUIDE**
- 46 **SEMACONNECT RELEASES SERIES 5 SMART EV CHARGING STATION FOR MULTIFAMILY APPLICATIONS**
- 47 **DRIVING FORWARD WITH YOUR HELP** — Working for EAA
- 49 **VINTAGE MERCURY TESLA-POWERED ICON “DERELICT” HOT ROD AT SEMA!**
- 49 **KYMERA FLOATS FAST, LIGHTWEIGHT AND POWERFUL ELECTRIC PERSONAL WATERCRAFT**
- 51 **SACRAMENTO OFFERING DC FAST CHARGING AT CURBSIDE!**

## Columns

- 3 **PRESIDENT'S COLUMN**
- 47 **EVENTS & CONFERENCES**
- 48 **NOTABLE VIDEOS**
- 50 **EAA MEMBERSHIP FORM**
- 52 & 53 **CHAPTER LISTINGS**



© *Current Events* is a members only e-magazine. No reposting of any issue is allowed on any website. Copies marked “For Display Only” may be showcased to the public. However, *Current Events* may not be distributed to non-members without the written consent of an EAA Board of Directors member. Unauthorized use of copyrighted material will be prosecuted to the fullest extent permitted by law.



Follow us on Facebook  
<https://www.facebook.com/ElectricAutoAssociation>  
 On Twitter: @EAANational <https://twitter.com/EAANational>



©2019 *Current Events* is a publication of the Electric Auto Association. All rights reserved. While *Current Events* and the Electric Auto Association strive for clarity and accuracy, we assume no responsibility for usage of this information. Permission to copy for other than commercial use is given, provided that full credit is given to originator of material copied. This permission does not extend to reprinted articles. 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.

## Officers:

*President:* Raejean Fellows  
*Vice-President:* Simon Freedman  
*Secretary:* Guy Hall  
*Treasurer:* Kelly Berry

## Directors:

Nathalie Belanger, Marina Cerin-Stith,  
 Ron Freund, Marc Geller,  
 John Higham, James Stephens

*Board Participant, Chapter Liaison:*  
 Charles Gerena

## Membership:

Nathalie Belanger



## Current Events Staff:

*Editor:* Ron Freund  
*Associate Editor:* Guy Hall  
*Managing Editor:* Dorothy Foglia

## Article Submissions:

The deadline for articles is the first of every month for consideration in the next issue of CE. Articles received after this date will be retained for future issues of CE. Send submissions to:  
[CurrentEvents@electricauto.org](mailto:CurrentEvents@electricauto.org).

## Advertisements:

A full advertiser's information package and Rate Sheet can be sent by E-mail. Please contact CE Staff for details.

## National EAA:

*Web Site:* [electricauto.org](http://electricauto.org)

## Membership/Address Changes:

*E-mail:* [electricauto.org](mailto:electricauto.org)  
*Mailing:* Electric Auto Association  
 P.O. Box 927090, San Diego, CA 92192

If you have comments, please send them to  
[ceeditor@electricauto.org](mailto:ceeditor@electricauto.org).

## Current Events Back Issues

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

## Please visit

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



# Enjoy Summer Travels in Your Cleaner Fueled Electric Car

*... and avoid high prices at the pump!*



Why is it when I hit the road in my electric car it is so much more of an adventure than it was in my gas car? Is it the interesting charging spots, like Lone Pine, CA next to the Museum of Western Film History <http://www.museumofwesternfilmhistory.org/> with soaring Mt Whitney in the backdrop?

The ride itself is quiet and peaceful ... the road becomes almost meditative. I even enjoy two-lane highway sections, knowing I can punch it to pass a slow truck. Yikes, did I just hit 100 mph? Better scale it back.

Is it the downhill section of Bear Mountain where the comforting pull of my regenerative power leaves me with more range than I started? I love playing the game. How much power can I store in my batteries by the time I reach the bottom of the hill?

With the summer heat, comes more ozone, more pollution. In fact, San Diego is the 6th most polluted city in

the U.S.\* However, my action to drive electric helps to cure the sick air; the air is that is making people sick, especially children and older folks.

It feels so good to be actually doing something to clean things up and to avert illness. Somehow my clean driving seems to deepen my experience of our nation's wilderness areas. Is John Muir watching?

In my electric car, no need to worry about escalating gas prices. Who wants to pay \$4 a gallon? I get to spend my vacation dollars on special experiences and gastronomic delights instead.

On the road, I have to pull power from the grid, and some ask, how clean is the grid? The Union of Concerned Scientists ([www.ucsusa.org](http://www.ucsusa.org)) has a tool to use your zip code to determine the average emissions from your electric utilities. Even when I am drawing power from the grid instead of my solar roof, I love that my EV energy use is

vastly cleaner than driving on gas. In fact, in two-thirds of the country, you would have to average over 50 mpg to achieve the equivalent level of carbon emissions as with an electric car. Here in San Diego, where we are 43% renewable energy, your gas car would have to achieve an average of over 100 mpg. And that is not happening! Gas cars are just dirty, dirty, dirty.

Wherever your journeys take you, be sure to wear your "Ask Me About my EV" Pin, so folks will feel free to ask you all those questions you know they are just bursting to ask you. Because we are not a household name yet, tell them who Electric Auto Association is and for more information go to: [www.ElectricAuto.org](http://www.ElectricAuto.org). Be sure to thank those you see who have taken actions to install chargers to help us along our way.

Thank you for all you do for electric vehicles.

Raejean

1,200,000 EVs in the U.S. and growing!



Raejean Fellows

\* American Lung Association 2019, State of the Air Report (Link to the report on our doc library—under research/whitepaper/report—ALA SOTA report)

\*\* If you do not own an electric car yet and want to vacation with an EV, you can rent one from [www.truro.com](http://www.truro.com).



## Thank you to our Supporting Members

### HIGH VOLTAGE DONATIONS - \$500

Jason France; James Green; Dave Hanson; Tiffany Hinton; Bill Hopkins;  
Rob Loblaw; Ben Sullins; Sven Thesen

### SUPERCHARGED PLUS - \$240

Alexander Brown	Tom Dowling	Joe Lervold
Karen Casner	Ron Freund	Kim Rogers
Scott Cronic	Marc Geller	Dan Vogler
Bob Dockendorff	Steve Greenberg	

### SUPERCHARGED UP - \$120

Alan Arrison	Jay Donaway	Rick Kominowski	Norman Pease
David Borth	Kevin Douglass	Margaret (Peggy)	Robert Poeschel
Rick Borth	Jason Ellis	Matarese	Bruce Rathbone
Stephen Braun	Jeff Finn	August Mathisrud	Rita Redaelli
Michael Bussler	Simon Freedman	Cindi McVeigh Wagner	Maurillo Sanchez
Anton Callaway	Gary Graunke	Todd Minnella	Mark Schiller
Don Clayton	Dennis Griffin	Bernard Moret	Richard Shipps
Keith Comstock	Christopher Hayden	Jordan Moyers	Alan Soule
Kyle Cuzzort	John Higham	Rob Neary	Mark Steffen
James Darnauer	Lawrence Jakobi	Jeff Nisewanger	Matt Walton
			Stuart Williamson

### CHARGED UP - \$60

Geoffrey Ainscow	Bob Erdman	Raymond Leury	Theresa Ramsdell
Raymond Alden	Larry Emerson	Michael London	Molly Roth
Ace Allen	Todd Flax	Douglas MacDonald	William Rothaus
Areg Bagdasarian	Brian Flippo	Edward Malkiewicz	Mike Sasnett
Kent Bakke	Fabrice Florin	Tom McCalmont	Ramin Shahidi
Lon Ballard	John Gaglione	Sarah McCann	Darren Sims
Varant Basmajian	Wayne Gale	Robert McCaston	John Sisk
Nathalie Belanger	Lee Gasper-Galvin	Maria Meyer	Jim Stack
Sean Berry	Steven Gilbert	Gary Miller	John Steiner
Jason Bloomberg	Jeffrey Gould	Duff Mitchell	Robert Stratten
Douglas Brentlinger	Chris Haley	Noel Morin	Chuck Swackhammer
Tom Bressan	Dean Hancock	Robert Neighbour	Jared Terpak
Omar Chatty	Michael Heaney	Stephen Noctor	Michael Thwaite
Steve Conley	Phillip Henke	Paul Olson	Joseph Voss
David Crow	George Hoech	Jeff Oring	Rusty West
Mike Cummings	Mark Hughes	John Overstreet	Steven Wypyszcak
Joe DiLellio	Jason Jungreis	Paul Pancella	Michael Zuteck
Stephen Distant	Sam Knight	Dennis Pestka	
Monica Duncan	Ray Kutz	Robert Powell	

Your generous donations are vital to supporting our activities.





## Take an EV Road Trip to the Stunning San Juan Islands

<https://www.visitsanjuans.com>

*Enjoy the unique benefits of an EV on a ferry ride.*



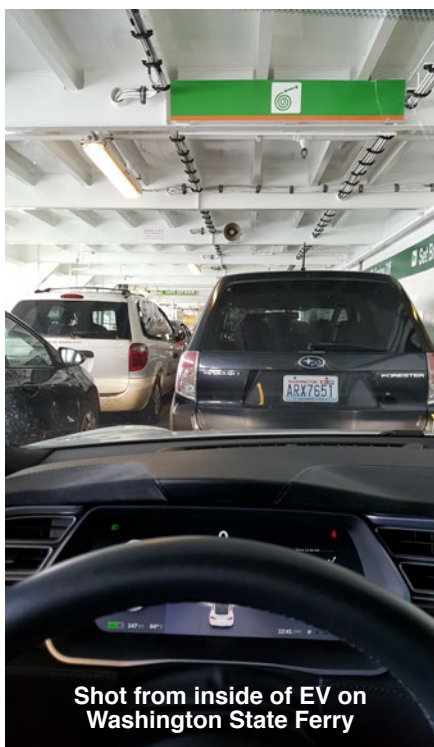
Orcas Island with Ferry

This May, EV Association of San Diego Vice President, Elaine Borseth is reminded of a trip she took in May 2015, from San Diego to Washington State, traveling on the West Coast Green Highway <http://www.westcoastgreenhighway.com/#/find/>

[nearest](http://www.westcoastgreenhighway.com/#/find/). The Highway boasts a charging station every 25-50 miles along the entire length of Interstate 5, and US 99 as well as on other major highways. The crowning glory of the trip was her last stop at the San Juan Islands, where her electric car got a beautiful ferry ride. See <https://www.wsdot.com/ferries/schedule/ScheduleDetailByRoute.aspx?schedrouteid=1820>. A little-known benefit is that while waiting for the ferry, all the gas cars must keep their engines off (nasty exhaust), however, not so with an EV. You can sit in air-conditioned comfort in your EV, avoiding the summer heat. Those sitting in gas cars — not so cool.

For an unforgettable stay in a luxury retreat, check out our advertising sponsor: **The Barn Gallery**

<http://www.oex.club>



Shot from inside of EV on Washington State Ferry

The San Juan's boast the only resident population of Orcas, where the whales like it so well, they never leave.



## Where will your EV take you on your next vacation?

How about to the Barn Gallery, an oasis of sustainable design in the San Juan Islands, only 2 hours, yet a world away from Seattle. Endless opportunities to create your own memorable experiences. Art Gallery living, with magical water & mountain views, Farm-to-Table dining in the red kitchen with local organic produce;



hiking, biking, sailing, island hopping; wildlife watching, orcas & eagles, kayaking around multiple islands...or charter a float plane to the outer islands!



Whatever you choose, remember to ask about Barn Gallery Specials only for EV

**Book your holiday at**  
<http://www.oex.club>

# Do You Shop at Amazon?

*Your purchases can benefit the Electric Auto Association!*

Amazon will donate 0.5% of the price of your eligible purchases if you start each shopping session at the URL <http://smile.amazon.com> and designate Electric Auto Association as your preferred charity. Amazon Smile will make the donation as long as you CHECKOUT from their smile.amazon.com domain.

If you like using Amazon's app and put stuff into the cart, it won't work with smile. The solution: after adding items to your cart switch over to [smile.amazon.com](http://smile.amazon.com) for checkout.



## Visit Your AmazonSmile Impact

Welcome to  
**amazon smile**

You shop. **Amazon gives.**

- Amazon donates 0.5% of the price of your eligible AmazonSmile purchases to the charitable organization of your choice.
- AmazonSmile is the same Amazon you know. Same products, same prices, same service.
- Support your charitable organization by starting your shopping at [smile.amazon.com](http://smile.amazon.com)

Questions? [Learn more about AmazonSmile](#)

Not interested? [Shop Amazon.com](#)

Represent a charitable organization? [Visit org.amazon.com](#)

**Sign In**

Your email address or mobile phone number:

Your Amazon password:

[Forgot your password?](#)

[Sign in using our secure server](#)

[New to Amazon? Create an account](#)

# TucsonEV.com

US Shipping now included  
in price - Check it out!!!

### 12/16/32A 120/240VAC EVSE

- 32A capable
- 120/240vac
- 14-50 Plug standard
- Great LED Display shows Status, kWh used Time, Volts, Amps, Temp, Etc



### Zero to J1772 Adapter

- 14AWG
- 18" cord
- C-13, C-19 and 5-15 Plugs
- Can have up to 3 plugs



### CHAdEMO Inlet and Plug

- Yazaki
- 500VDC
- 120 Amps
- 1m cord



### Plugs with and without Cord



### 20ft 30A or 40A Extension Cord

- Any length cord in 30A or 40A
- All Plugs and Inlets are 50A rated

### Inlets with and without cord



- 10AWG, 8AWG and 6AWG
- 1m to 10m lengths

### J1772™ Adapter Boxes

- For Conversions so that they can use Public J1772 EVSE's



- Remote and regular, 30A - 50A

### EVE 40A Cord

- Orange Jacket, UL Certified 105 deg C
- Use as EVSE cord or J1772 Extension
- 2 legs of the 12AWG are connected for 40A like the Tesla UMC 40A EVSE

### EVE 30A Cord

- Black Jacket, UL Certified 105 deg C
- Use as EVSE cord or J1772 Extension
- 10AWG Power and Ground

Quantity discounts available, for more information and pricing:

**[www.TucsonEV.com](http://www.TucsonEV.com) or [EV@TucsonEV.com](mailto:EV@TucsonEV.com)**

Feb 2019



# EV Educational Resources

for Individuals, Groups and Organizations

**Electric Car**  
INSIDER



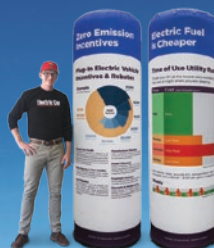
## EV Buyers Guide

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**





## NEWS FROM CONGRESS

For Immediate Release

Contact:

Miranda Margowsky (Stabenow)

APRIL 10, 2019

202-224-1154

### Stabenow, Alexander, Peters, Collins, Kildee Introduce Bipartisan Bill to Expand Electric Vehicle and Hydrogen Fuel Cell Tax Credits

*Legislation would allow an additional 400,000 electric vehicles per manufacturer to be eligible for tax credit*

**WASHINGTON, D.C.** – U.S. Senators Debbie Stabenow (D-MI), Lamar Alexander (R-TN), Gary Peters (D-MI), and Susan Collins (R-ME) along with Congressman Dan Kildee (MI-05) today introduced the Driving America Forward Act, bipartisan legislation to expand the electric vehicle and hydrogen fuel cell tax credits. Under current law, consumers may receive a tax credit of up to \$7,500 if they purchase an eligible electric vehicle. However, the tax credits begin to phase out permanently once automakers sell over 200,000 units. The Driving America Forward Act raises the cap and allows purchasers of an additional 400,000 vehicles per manufacturer to be eligible for the tax credit.

“At a time when climate change is having a real effect on Michigan, today’s legislation is something we can do now to reduce emissions and combat carbon pollution,” **said Senator Stabenow**. “Our bill will help create American jobs and cement Michigan’s status as an advanced manufacturing hub.”

“Ten years ago there were no mass produced electric cars on U.S. highways, and today, there are about one million and automakers are planning to make millions more,” **said Senator Alexander**. “The all-electric Nissan Leaf that I bought in 2011 had a hard time getting me from the Capitol to Dulles airport and back. Its real range was about 70 miles. Today’s Nissan Leaf can travel 226 miles on one charge. Investing in American research and technology for better electric vehicles is one way to help our country and the world deal with climate change. I’m glad to cosponsor this important legislation, which will encourage even more production of electric vehicles, create good jobs and boost the economy.”

“Expanding tax credits for electric vehicles would benefit

consumers and our environment,” **said Senator Peters**. “Continued investment in advanced technologies of the future will help Michigan stay at the forefront of global auto innovation, spur job growth and move us toward a more sustainable and competitive transportation future.”

“In less than four years, the number of Mainers who own electric cars has more than doubled. This legislation would continue the momentum towards cleaner transportation and help tackle harmful transportation emissions, which produce more than half of Maine’s carbon pollution and threaten our public health, natural resources, and economy,” **said Senator Collins**. “I encourage our colleagues to join us in supporting the Driving America Forward Act to extend tax credits for electric vehicles and hydrogen fuel cell vehicles and make these vehicles more affordable to consumers.”

“This bipartisan legislation helps to address the urgent threat of climate change with bold solutions that help to create jobs in Michigan,” **said Congressman Dan Kildee**. “Putting more electric vehicles on the road will reduce carbon emissions and support investment in American-made manufacturing. This legislation is a win-win when it comes to protecting our planet and growing our economy.”

Sales of electric vehicles increased by more than 80 percent [<https://www.greentechmedia.com/articles/read/us-electric-vehicle-sales-increase-by-81-in-2018#gs.bilq4i>] in 2018 and two manufacturers have already hit the lifetime cap of 200,000 units. Under current law, after an automaker sells 200,000 qualifying vehicles, consumers are eligible to receive the full value of the \$7,500 tax credit through the calendar quarter after the cap is hit. The value of the credit to consumers from this automaker then decreases to 50% and 25% over the next

*continued next page*

12 months before being phased out entirely.

The Driving America Forward Act raises the cap by allowing purchasers of an additional 400,000 vehicles per manufacturer to be eligible for a \$7,000 tax credit. Consumers can receive the full value of a \$7,000 credit through the calendar quarter after the 600,000th vehicle is sold. The value of the credit to consumers from this automaker then decreases to 50% before being phased out entirely after six months. The bill maintains the \$7,500 tax credit for the first 200,000 units sold.

The Drive America Forward Act also extends the hydrogen fuel cell credit for ten years, through 2028. The legislation is also co-sponsored by U.S. Representatives Don Beyer (VA-08), Earl Blumenauer (OR-03), Brian Higgins (NY-26), Jimmy Gomez (CA-34), Stephanie Murphy (FL-07), Jimmy Panetta (CA-20), Terri Sewell (AL-07), and Tom Suozzi (NY-03).

Senator Stabenow championed the electric vehicle tax credit and the production of alternative vehicles here at home in the American Recovery and Reinvestment Act of 2009. She has since led efforts to expand the tax credit and create more opportunities for clean energy manufacturing in Michigan and across the country. In addition to being more energy efficient, electric vehicles produce lower emissions on average than conventional gas vehicles do. An average electric-powered vehicle will produce 3.3 fewer tons of CO<sub>2</sub> emissions and burn 480 fewer gallons of gas per year compared to an average gasoline-powered vehicle.

The Driving America Forward Act is supported by 60 organizations, including ABB Inc., Advanced Energy Economy, Alliance of Automobile Manufacturers, Alliance to Save Energy, American Lung Association, Association of Global Automakers, BMW of North America, CalStart, Center for Climate and Energy Solutions, CERES, Charge Forward LLC, ChargePoint, ChargeUp Midwest, Clean Fuels Michigan, Consumers Energy, Copper Development Association, DTE, Eaton, Ecology Center, Edison Electric Institute, Electrify America, Electric Auto Association, Electric Drive Transportation Association, Electric Vehicle Charging Association, eMotorWerks, an Enel Group Company, Environmental Defense Fund, Environmental Law and Policy Center, EV Drive Coalition, EVgo, FCA US, Ford Motor Company, FORTH, Fuel Cell and Hydrogen Energy Association, General Motors Company, Greenlots, Honda North America Inc., ITC Holdings Corp., League of Conservation Voters, Lyft, Michigan League of Conservation

Voters, Motor and Equipment Manufacturers Association, NAFA Fleet Management Association, National Rural Electric Cooperative Association, Natural Resources Defense Council, Nissan North America, Panasonic Corporation of North America, Plug In America, Rivian, Securing America's Future Energy, SemaConnect, Siemens Corporation USA, Sierra Club, Silicon Valley Leadership Group, TE Connectivity, Tesla Inc., The Nature Conservancy, Toyota Motor North America, Union of Concerned Scientists, Volkswagen Group of America, and Volta.

"FCA US applauds Senators Stabenow and Alexander's leadership in supporting electric vehicles," **said Shane Karr, Head of FCA US External Affairs.** "Measures like the Driving America Forward Act are needed to help grow market demand for electric vehicles."

"This bill will help Ford grow our electrified vehicle portfolio, which includes iconic models our customers know and love," **said Joe Hinrichs, Ford's President, Global Operations.** "Ford is investing \$11 billion in electrified vehicles through 2022. Expanding the existing framework gives our U.S. plants the ability to produce smarter, fuel-efficient vehicles for years to come. It also ensures that American manufacturers can stay competitive in this new automotive era."

"General Motors believes in an all-electric, zero-emissions future. We are dedicating significant resources and investments to manufacturing and infrastructure here in the United States to drive that vision," **said Mark Reuss, President, General Motors.** "We appreciate the support and leadership of the Senators and Representatives; the EV tax credit provides customers with a proven incentive as we work to establish the U.S. as a leader in electrification."

"We commend Senators Stabenow and Alexander and Congressman Kildee for their leadership on this critical issue," **said Dave Schweitert, Interim president & CEO, Auto Alliance.** "This bipartisan bill will help drive deployment and consumer acceptance of these energy-efficient, alternative powertrains. Automakers are investing substantially in electric vehicles, with 58 models on sale and more coming, but overall sales remain low. Consumer tax incentives and rebates, as well as charging infrastructure, are key building blocks to help get more of these energy-efficient vehicles on our roadways."

"These credits accelerate the growth of the U.S. electric  
*continued on page 53*



## First Annual Drive Electric Earth Day Tallies 188 Events

### *Coast to Coast, Cities Celebrate the Significant Environmental and Consumer Benefits of Electric Vehicles*

**Nationwide** — Throughout the month of April, the first ever **Annual Drive Electric Earth Day** was held, with 188 events taking part across the United States, as well as Canada, the Dominican Republic, Mexico and New Zealand. Building upon the success of National Drive Electric Week, an annual event held each September for the past eight years, **Plug In America**, the **Sierra Club**, and **Electric Auto Association** partnered for **Drive Electric Earth Day** to give communities across the U.S. and beyond more first-hand opportunities to learn about zero emission vehicles through local Earth Day events. These events celebrated the significant and wide-ranging benefits of electric vehicles (EVs), bringing together public officials, policymakers, local media, and the general public. Highlights:

- 188 registered events
- More than 100,000 attendees
- More than 1,700 test rides and drives
- More than 240 event organizers and volunteers
- 44 US states
- 5 countries

Some events incorporated new, exciting local developments on the EV front, such as the installation of new electric vehicle fast chargers. EVs reduce emissions from transportation, the leading sector contributing to carbon pollution, in addition to improving public health and providing fuel and maintenance savings for consumers. Sales of EVs in the U.S. increased 81 percent last year, and there are now approximately 50 models of EVs available, many with longer ranges at lower prices than in previous years.

“The first Drive Electric Earth Day far exceeded our expectations,” said Joel Levin, executive director of **Plug In America**. “Plug-in vehicle drivers love their cars because they’re better for the environment, easier to maintain, and more fun to drive.”



Photos taken from the San Diego Event

*continued next page*



## DRIVE ELECTRIC EARTH DAY

These events give those drivers the opportunity to share their enthusiasm about EVs with others.”

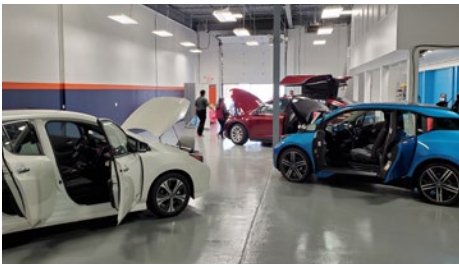
“We’re at a pivotal moment in electric vehicle adoption. Demand for EVs is rising, prices continue to drop, and more and more models are becoming available each year,” said Hieu Le, a campaign representative with Sierra Club’s Clean Transportation for All campaign. “Now is the time to provide more and more outreach opportunities for communities to learn about the cost-savings and climate benefits of electric vehicles, experience them first-hand, and hear directly from those that drive them and love them.”

“This was an incredible year in presenting the breadth of EVs to the public,” said Guy Hall, Director of **Electric Auto Association**. “Across the country, EV drivers joined existing community Earth Day events to show and demonstrate that EVs are here today, and not only are they better for the earth, they are fun to drive and cheaper to own.”

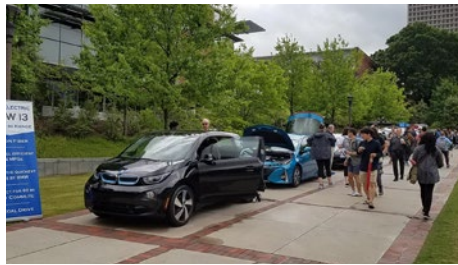
“Showcasing EVs was the highlight of our Earth Day event. Having EV owners interacting with event attendees allowed discussion and opened up dialogue to be proactive in building an alternative to fueling our vehicles with fossil fuels,” said Emily Beals, the Event Manager for the **Drive Electric Earth Day** event in Amador County, California.

### FOLLOWING ARE PHOTOS TAKEN FROM VARIOUS DEED EVENTS ACROSS THE US

If you wish to see additional locations not depicted here, follow the URL below  
<https://driveelectricearthday.org/media.php#photos-videos-tab> and then click on the year ‘2019’ link.



Allentown, PA



Atlanta, GA



Augusta, GA



Baton Rouge, LA



Bellevue, IL



Bellevue, WA



Bellingham, WA



Bexley, OH



Blacksburg, VA

*continued on page 12*



## DRIVE ELECTRIC EARTH DAY

**DEED** continued from page 11



BlueAsh, OH



Braintree, MA



Carson, CA



Casselberry, FL



Cazenovia, NY



Cleveland, OH



Columbus, OH



Concordia, KS



Cupertino, CA



Danvers, MA



Dayton, OH



Denali Park, AK



Des Moines, IA



Edmonton, AB



Grass Valley, CA

*continued next page*



## DRIVE ELECTRIC EARTH DAY



Greensboro, NC



Halifax, VA



Hermosa Beach, CA



Hilo, HI



Huntington, WV



Independence, MO



Ithica, NY



Jackson, CA



Juneau, AK



Kalamazoo, MI



Kilauea, HI



Knoxville, TN



Las Vegas, NV



Lawrence, KS



Maplewood, NJ

*continued on page 14*



## DRIVE ELECTRIC EARTH DAY

**DEED** continued from page 13



Middleborough, MA



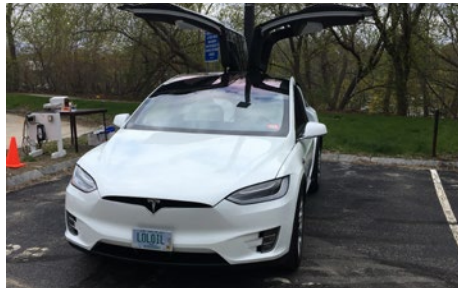
Montrose, CO



Moscow, ID



Muskegon, MI



Nashua, NH



New Orleans, LA



Newport, OR



Oakwood, OH



Oceanside, CA



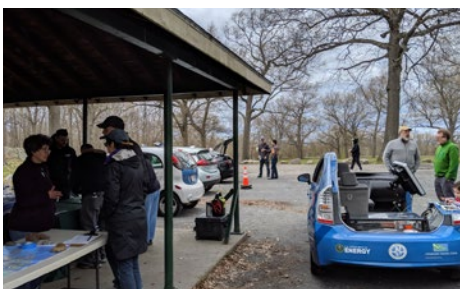
Olympia, WA



Penfield, NY



Queretaro City, Mexico



Quincy, MA



Raleigh, NC



Rapid City, SD

*continued next page*



## DRIVE ELECTRIC EARTH DAY



Redwood City, CA



Regina, SK



Rehoboth Beach, DE



Richmond, VA



Rochester, MI



Sacramento, CA



Salt Lake City, UT



San Francisco, CA



Santa Clara, CA



Santa Cruz, CA



Santo Domingo, Dominican Republic



Satellite Beach, FL



Savannah, GA



Scottsdale, AZ



Skaneateles, NY

*continued on page 16*



## DRIVE ELECTRIC EARTH DAY

**DEED** continued from page 15



Skokie, IL



Slippery Rock, PA



Somerset, NJ



Spokane Valley, WA



Sudbury, ON



Syracuse, NY



Taunton, MA



Thousand Oaks, CA



Tolland, CT



Upper Saddle River, NJ



Ventura, CA



Victoria, BC



Washington, DC



Waterville, ME



Westminster, CO

*continued next page*



## DRIVE ELECTRIC EARTH DAY



Whangarei, New Zealand



Wheaton, MD



Williamstown, NJ



Wooster, OH



Zionsville, IN

## 2019 Sacramento ECOS



**The Environmental Council of Sacramento (ECoS)** teamed up with the Sacramento EAA chapter (SacEV) in one of the ten Sacramento region DEED events. This 23 vehicle EV Showcase included an early driveable roadster EV conversion and the Freewire Mobi, a portable, mobile battery charging station. The Mobi charging station was the only vehicle allow to drive during the event, demonstrated with a rider on the top of the charging unit.



## Karma Presents its Electric Car Vision to China and Vies for Partners



*By Sebastian Blanco*

Karma Automotive doesn't have just one vision for its future. It has three.

The Southern California automaker unveiled a trio of new vehicles at the Shanghai auto show this week, ranging from a near-production look of the next version of the Karma Revero to a fanciful concept called the SC1.

The third, a design experiment done in partnership with Pininfarina, was present to show another way that the Revero, and Karma's overall design language, could evolve.



The vehicles and the display booth are part of Karma's delayed introduction party to the Chinese market. Even though Chinese automotive supply company Wanxiang Group bought the remains of Fisker Automotive and

turned them into Karma in 2014, it is only now that the company is finally ready to start promoting and selling its cars to the Chinese public, Karma CEO Lance Zhou told *Green Car Reports*. "We need to sell our brand, we need

to sell our technology, we need to sell our strategy," he said, explaining why Karma is participating in the Shanghai show this year. Getting potential customers to visit the booth, which was  
*continued next page*



situated near other luxury brands like Maserati and Bentley, is a good way to enter the massive Chinese auto market.

Automotive sales in China were 28.1 million units in 2018, an unusual drop (down 2.8 percent from 2017) after two decades of steady increases. “We need to participate in this market, start to build our brand image,” Zhou said.

The Nikkei calculated that in 2017, almost 90 percent of sales growth in leading luxury automakers and 27 percent of their overall sales came from China.

The three vehicles were there to draw people to the Karma stand, a strategy that obviously worked to generate tons of selfies and social media posts. The SC1 Vision Concept’s scissor doors kept opening and closing as the sleek two-seater rotated on its turntable. People were able to sit inside the Pininfarina GT, but it’s the new 2020 Revero GT that was there to gin up the most concrete interest since Karma is taking pre-orders now for its first deliveries in China some time by 2021.

## Revero GT: More details

As the only almost-ready-for-production model out of the three on display, Karma has released the most information about this model. The 2020 Karma Revero GT is a revised version of the current Revero, which itself is an updated Fisker Karma that first went on sale in 2011. In addition to a few minor design updates, the new Revero GT will use a BMW turbo-3 engine to power the on-board electric generator and “enhance overall vehicle performance,” Karma said in a statement.

The Revero GT’s 0-60 time will be 4.5 seconds, thanks to rear-wheel drive with  
*continued page 20*



## Karma Vision

*continued from page 19*

two electric motors and it will have up to 80 miles of electric range and a total range of 360 miles from its battery and gas tank. The car has a Level 2 plug and a 6.6-kilowatt onboard charger that will fill the 28-kilowatt-hour LiFePo4 battery in about four hours.

The 2020 Karma Revero GT also has a 45-kw DC fast charger that Karma says will get the battery to 90 percent full in 34 minutes using 480 volts at 125 amps.

### Angling for the mass market

Talking to potential customers is only one reason Karma is introducing itself to China now, Zhou said. The other is that he wants to start talking to companies that Karma could partner with, to move into the next phase of its operations: producing mass-market vehicles.

While Zhou said Karma will always build its luxury models in California and export them around the world, that might only account for 500 to 1,000 sales in a good year. Karma wants to get into the mass-market game, and that means building at least 100,000 vehicles annually, he said. If you can't do that, it's difficult to amortize investments and make profits.

"We have focused on craftsmanship for luxury cars. Mass production we are not so good at," he said. "We are looking for partners who have production experience, supply chain experience and also dealers."

Karma hasn't yet started talks with possible partners, but Zhou said he



hoped the Shanghai debut will open some doors. He said that Karma is open to working with both traditional OEMs and other start-ups, since large automakers have the knowhow to build hundreds of thousands of cars a year while new companies can bring in fresh ideas.

Not partnering will only make his company's work more difficult, he said.

"I think Tesla walks a tough road," he said. "If they can work together with a big OEM and utilize technology and expertise, they will be much better than today. I think the best company for the future is not a traditional OEM and it's also not a new EV producer. I think the best one is a combination of both."

### The fully electric future

The rocket-like sheetmetal of the SC1 Vision Concept hid another part

of Karma's future: one that is not a combination at all. The SC1 is fully electric, and Zhou said that while he sees gas-powered range extenders having a place in the luxury segment for the next 10 or 20 years because charging infrastructure will still not be fully fleshed out in that time, he recognizes that EVs will come to dominate.

"I do believe in the future, the main powertrain is going to be pure electric," he said, adding that he expects Karma's line-up to be 70 percent pure EV and 30 percent range extenders in the coming decades. "That's the reason our company will have two solutions. We will develop a pure EV along with our extended range powertrain."

Photos are the Karma SC1 Vision Concept – 2019 Shanghai auto show.



[https://www2.greencarreports.com/news/1122683\\_karma-presents-its-electric-car-vision-to-china-and-vies-for-partners](https://www2.greencarreports.com/news/1122683_karma-presents-its-electric-car-vision-to-china-and-vies-for-partners)



# Kia Niro EV – The New Normal...Electric Family Car

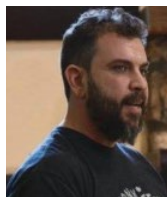


By Seth Weintraub

Ever since it was announced, Kia's Niro EV has been an interesting proposition. Fred Frederick at *Electrek* did a fantastic one day first look at the Niro earlier this year, but I wanted to spend some more quality time with it and throw in my family for "extreme" testing.

Our Tesla Model X lease is ending soon and my wife is looking for a replacement that rides high, has good range, and is all-electric. Obviously the Model Y makes a lot of sense for us, but it won't be ready until late next year and figuring "Elon Time", ramp up, and first dibs to Californians, it will probably be well into 2021 before these are rolling out en masse.

A recent trip to the Bay Area to visit relatives provided a good week-plus opportunity to test the Kia Niro EV with the whole family and without a 240V home charger...



Seth Weintraub is Publisher and Editorial Director of the 9 to 5/ Electrek sites. Tesla and soon to be Chevy Bolt owner.

## Niro appearance

First of all, I will say that the Niro outsteps its step cousin the Hyundai Kona in both form and function. Sure they have a very similar drivetrain and battery, but the Kia Niro looks a lot more like a crossover or SUV with its higher stance. That makes significantly more room inside and a better drive height while only penalizing the range by a few miles (239 miles/charge). Fred noted that the front grill on the Niro has the charge port which he disliked. While I'm ambivalent about it — it sure beats that faux grill on the Kona.

The Niro isn't going to win any design contests, but along with its hybrid and plug-in hybrid siblings, they don't exude "weirdmobile" at all either. In fact it was hard to discern that this was even an electric vehicle from the back and sides. A lot of people, present company included, like that.

I got the premium black model. I like it

## Kia Niro EV Competition

Besides the aforementioned 2021 Tesla Model Y and Kona EV, I would also put the Chevy Bolt and Nissan Leaf e-Plus in the same grouping of long-range crossover-ish hatchback EVs. As you can see in the chart below, they are all pretty similar. I have owned a Chevy Bolt for over two years and have driven the other cars on occasion, so I feel like I know this class inside and out.

*continued on page 22*

# Kia Niro EV

*continued from page 21*

## Kia Niro EV Drive Experience:

You get in the car, you push the power button and you DIAL into drive. Yes DIAL. The Niro has a dial rather than a normal gear shifter. I don't know why, but it took a little getting used to and I'm not sure why EV manufacturers think they need to reinvent the wheel on gear shifters. BMW's i3 comes to mind here. The Chevy Bolt's fake shifter isn't perfect but at least you intuitively know how to use it even before stepping into the car. I eventually got used to the dial, but again, why?

## Regen Paddles

Behind the steering wheel are 2 paddles that control the amount of Regen. Clicking right means more and left means less. Every time you start the car you are in level 2. This is somehow worse than the Chevy Bolt which forces you to double-click down to "L" if you want strong regen.

Advice to EV makers: After the first week or so, almost everyone wants max regen all the time. Make this the standard and require extra clicks to make it regen less.

As for the regen, at max, it didn't feel as strong as the Chevy Bolt, but was more powerful than Tesla's current regenning and I was able to do most of my driving with one pedal.

Specs	Niro EV	Bolt EV	Kona EV	Leaf e-Plus
Range (miles)	239	238	258	226
Battery (kWh)	64	60	64	62
Motor Torque (ft-lbs)	291	266	291	250
Length	172.2	164	164.6	176.4
Width	71.1	69.5	70.9	70.5
Height	61.8	62.8	61.8	61.6
Wheelbase	106.3	102.4	102.4	106.3
Passenger Volume (Cu. ft.)	96.6	94.4	94.1	92.4



*continued next page*



### Good, not great acceleration

Probably the biggest disappointment I had with the Niro was the off the line acceleration. Sure it beats most ICE cars, but with a bigger battery and motor than the Chevy Bolt, I expected another level of G forces out of the gate. Nope, the Bolt crushes the Niro.

Instead, even in sport mode, I found the lack of acceleration to be off-putting. It really zaps the fun out of driving an EV when it accelerates like a budget ICE crossover. Of course my paranoid mind wonders if Kia is throttling the acceleration to keep its other offerings relevant. I think the Nissan Leaf might be quicker off the line (ouch).

Especially in sport mode I found highway 45-65 type acceleration to be much better and more similar to the Chevy Bolt or Nissan Leaf. The Niro really shines on the freeway, zooming around quietly and effortlessly.

Braking seems very solid for a car in this class. I had the family in the car most of the week so no intense brake tests this time.

### Handling

The Kia Niro EV is about the only budget BEV I'd feel comfortable taking onto soft gravel and doing some light off-roading. During my time in the Bay Area, I found some bumpy mountain dirt roads to test on. While I wasn't blown away by the way it handled itself, I was almost completely confident in not getting stuck or breaking something. I would not recommend taking the Niro into mud or 'very' off road. It just doesn't have the suspension, AWD, clearance or tires to properly navigate in real dirt. However gravel and the odd pothole are no match for the Niro.

On the road, the Niro handles admirably for a small budget crossover. I found



less wheel slip than I would expect in my Chevy Bolt, particularly on gravel or wet surfaces, and it also wasn't as tight on turns on dry surfaces. There was no winter climate to be found or tested on this trip.

### Interior

The interior of the Niro really shines when compared to the Bolt, but it is even good compared to Nissan's Leaf and others in this class. I, of course was given the EX premium package and it felt as nice as you could expect for a \$35,000 Kia. There are tons of buttons, some being redundant (like the "EV" button, in an EV! What happens when it isn't in EV mode? Is it off?). Point is, if you like buttons for everything and even a few things that you don't even know what they do, this is your car.

Kia's drive software isn't great, but I imagine most people will be almost exclusively using CarPlay or Android Auto for maps and music. For that it does work well, though I did have some freezes and black screens which

were easily remedied by unplugging/plugging in my phones again.

I tried using the built-in 'find the nearest charging spot' software but gave up because the Plugshare app on my phone was so much easier and more helpful.

I would suggest some rear seat USB ports to Kia. We had to buy some extra long USB cords for the kids in the back. There is one hidden under the arm rest as well. There's also a lighter port which you can use to charge an extra device in addition to the 3 USB ports included. Only one of them is for the console so you need to physically swap if you want to change phones on CarPlay.

The seats are more comfortable than the Bolt and probably as comfortable as the Nissan Leaf. One thing I love about the Bolt is getting into the higher seats and the Niro felt almost as easy to get into and out of. Looking at the

*continued page 24*

# Kia Niro EV

*continued from page 23*

vehicles next to each other, the Bolt still does ride higher, but you won't notice a difference.

The kids had no problem falling asleep in the back on the way to the airport for our early departure.

Trunk space was quite nice but there's no frunk. I was able to fit a very large duffle suitcase and a large backpack and could have probably stuffed some more in there. The Bolt's trunk is surprisingly big and deep vertically but I think the Niro is bigger overall.

## The stereo rocks

The premium Harman Kardon stereo is fantastic. I'd even say slightly better than the Premium Tesla sound system and the Bolt premium Bose system in my experience. They really nailed this one – great separation and bass playing off of CarPlay or even the FM tuner.

## Charging with the Kia Niro EV

The car I got came with an orange Level 1 110V charger and frankly for most people this is all you will 'need' on a day to day basis. Because of the Niro's solid efficiency, this equates to 5 miles/hour of charge out of a normal outlet. A 12 hour overnight charge will give you at least 60 miles of range, more than enough for the average commuter.

The Niro, as most EVs do now can accept up to 7.2kW of power (or over 11 in 3 phase Europe) on 240V outlets which will take the car from empty to full in under 10 hours. That means if you have a 240 at the house, you wake up with a full 'tank' every morning.

I want to say this loud and clear. If there are dangly plug-ins that need to be removed every time you plug in, you've lost the plot. Companies like Tesla and even Chevy where EVs aren't an afterthought wouldn't dare to have these things hanging out. But here we are:

If I owned this car, I'd probably cut these off with some scissors.

DC fast charging was a bit of a disappointment. I visited one of the few 100kW CCS combo fast chargers in California which was at the ChargePoint HQ. Unfortunately, with the Niro's incredible efficiency, I didn't start with much under



50% of the range so I only got to charge with some of the taper already in effect.

*continued next page*





Kia says that the Niro EV will DC fast charge over CCS combo to 80% in 75 minutes on 50kW and 60 minutes on 100kW. The reason the math doesn't work out there is that it never reaches 100kW and in my testing barely reached 70kW. The reality is that right now even 50kW chargers aren't easy to find and 100kW ones from Electrify America, Charge Point, and EVGO are just starting to be produced. For travelling over 200 miles, you will need to do some planning. I'd suggest Plugshare.com.

### Conclusion

If I had to choose between the Bolt, Kona, Niro, and Leaf with the same features and range, I would stick with my decision to buy the Chevy Bolt EV. Besides being available for purchase, the Bolt is straight up fun to drive. Driving the Niro is amusing at best, utility at worst. Also I love the smaller footprint of the Bolt vs. the longer Niro, particularly in my tight garage.

That said, the Niro is fantastic for the utilitarian customer it is aimed at. It is pleasant inside, drives nicely, has very long range and very decent power. The stereo and infotainment are great as is the ride height. Charging options are as good as they are going to get for a non-Tesla EV.

The problem however is that both Hyundai and to a lesser extent Kia never make enough of their EVs, nor do they market them, or sell them outside of ZEV states. That means dealers will try to price gouge and we've already heard of markups of this car that approach the \$7500 federal tax credit – which is a real shame. A lot of people would love to drive this car.

[More complete specs and a video at the URL below.]



<https://electrek.co/2019/05/07/kia-niro-ev-review/>

# Electric Ford Bronco from Zero Labs Enters the Restomod Fray

*It has a 190-mile range and is built on a restored Bronco chassis*



Electric Ford Bronco by Zero LabsZero Labs plans to build electric original Ford Bronco.Image Credit: Zero Labs

*By Zac Palmer*

Excitement over a new Ford Bronco from Ford has been feverish for awhile now, and that has only encouraged people to make original Broncos new again. There are a number of these projects out there, but today we get to tell you about one that is rather unique. Let us introduce you to the Ford Bronco made by Zero Labs. It's not like all the others, because it happens to be electric.

You could deduce such a fact just by looking at the front end's lack of a grille, but the rest of the truck looks a whole lot like a normal first generation



*continued next page*

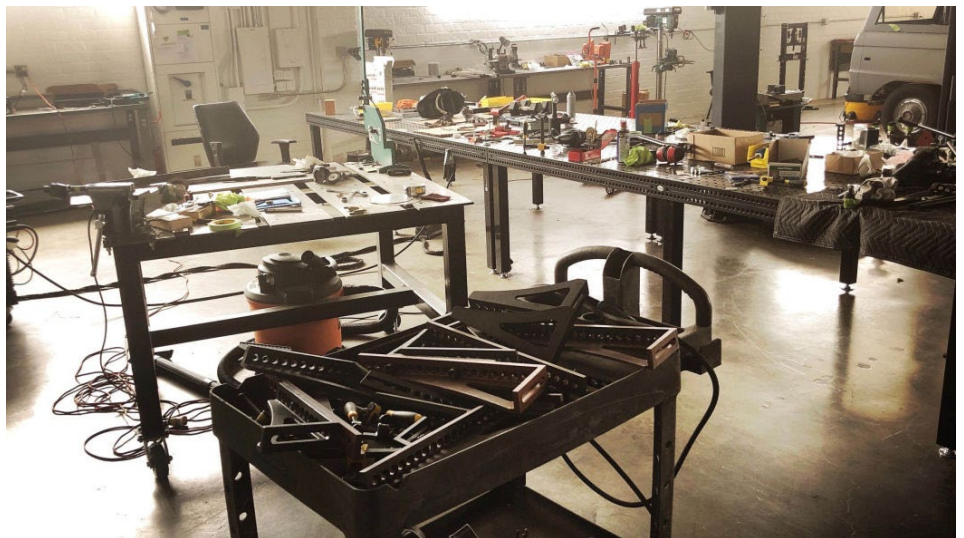


two-door Bronco. Zero Labs bills itself as a company that is going to produce electric versions of classic cars, but this is the first vehicle it has plans to make. The company is based out of Southern California and was founded in 2015.

A ton of the details vary substantially compared to what the original Bronco looked like, but we'd say it's easily recognizable. Zero Labs even managed to use the "Ford" and "Bronco" logos on the vehicle. If you're a fan of the original Bronco but still dig electric cars, it's almost impossible to go wrong with this design. We love it, and we imagine many others will, too.

As for the technical side of things, Zero Labs says it starts with an original Bronco chassis, then restores it and rebuilds from there. In place of a gasoline burning engine, Zero Labs has fitted a 70-kWh lithium-ion battery pack hooked up to a BorgWarner permanent magnet electric motor — no source was provided for the battery pack as of now. Some key specs were provided. It has a 190-mile range and makes 369 horsepower. It's capable of Level 2 charging, but no time estimates are available.

Zero Labs says it's capable of "part time/full four-wheel drive." They use Currie front and rear differentials, an Atlas two-speed transfer case and a five-speed manual transmission to send the power to the ground. You don't see manual transmissions in electric cars often, but you can do it, especially with conversions. Zero Labs decided to fit an adjustable Fox coilover suspension to help you out when off-roading, too. It has a modern braking system now with six-piston Brembos up front. We'll assume that's necessary to slow down the Bronco with a heavy battery pack in it. *continued on page 28*



## Bronco Restoration

*continued from page 27*

The materials used throughout the vehicle are all pretty astonishing. Body panels were redesigned and many are now made out of carbon fiber. Walnut and bamboo panels grace the interior of the Bronco, along with both leather and “vegan” interior material options. Zero Labs does a lot of the interior work by hand. We’re pretty blown away by the incredible combination of modernity and classic touches on the interior.

You’re probably wondering how much something like this costs, but Zero Labs does not have a price yet for its Ford Bronco electric restomod. You can place a reservation for free, though. Another pivotal bit of information we don’t have is a delivery or on-sale date. However, Zero Labs says it has plans to make 150 “first edition” vehicles like the one you see here. There are some videos that are a bit spacey on the company’s website you can check out here, if you want to see the electric Bronco in motion.



[There are more photos of the restoration on the website below.]



<https://www.autoblog.com/2019/04/19/zero-labs-ford-bronco-ev-restomod/#slide-7564632>



# Jaguar is Developing a Fully Electric Car to Join I-Pace Crossover

*Design chief Ian Callum also says there's plenty of life left in sedans*

By Sven Gustafson

Straight from nabbing the World Car of the Year award at the New York International Auto Show for the new 2019 I-Pace electric crossover, as well as publicly unveiling the 2020 XE sport sedan, Jaguar's design chief says the brand is also developing a car with a fully electric powertrain.

"We are doing more battery cars at Jaguar, yes," Ian Callum told Autoblog. "That's all I'm saying." Callum wouldn't divulge further details except to add, "When you're doing electric cars, they're new cars. They're not just batteries put in an old car. You can't do that."



Jaguar has been rumored to be planning a potent all-electric version of the XJ based on its flexible new Modular Longitudinal Architecture. Jaguar Land Rover has said that it plans to offer each new or significantly redesigned model in electrified variants starting in 2020. Land Rover is also showing a mild-hybrid version of the 2020 Range Rover Evoque and 2019 Range Rover Sport, plus plug-in hybrid variants of the 2020 Range Rover and Range Rover Sport.



In addition to being named World Car of the Year, the I-Pace took home World Car Design of the Year and World Green Car of the Year. The F-Pace, the brand's flagship SUV, won World Car of the Year in 2017.

Callum also said he believes that sedans have a future, even as he acknowledged the importance of SUVs as the brand's volume-selling "breadwinners." Jaguar is an increasingly rare breed of automaker with more cars, at four [the F-Type, XE, XF and XJ] than SUVs [the I-Pace, E-Pace and F-Pace].

"The vehicle mix is the right balance," he said. "I personally don't believe that sedans are going to disappear. People will continue to go with sedans. The range you see currently will be eventually replaced by like-sized cars. That's all I can say about that at the moment, but the XJ will be replaced, and eventually the XE and XF will be replaced. I really believe the cars are here forever, I don't think they're going to disappear in favor of SUVs."

—

<https://www.autoblog.com/2019/04/17/jaguar-electric-car/>

## 2020 Hyundai Ioniq Electric Gets More Range & Power, Faster Charging – in Europe

By Eric C. Evarts

The 2020 Hyundai Ioniq Electric will get a big boost in range along with more power when it goes on sale later this year in Europe.

New specs released by Hyundai's European sales organization point to a significant update to the car, though when *Green Car Reports* reached out to Hyundai's U.S. arm, spokesman Brandon Ramirez would say only that the company "will provide U.S. Ioniq updates at a later date."

In Europe, the 2020 Ioniq will get a significantly larger 38.3 kilowatt-hour battery pack, up from the current 28 kwh, along with a faster 7.2 kilowatt on-board charger, up from 6.6 kw.

Hyundai says the bigger battery should give the 2020 Ioniq 184 miles of range on the relatively generous new WLTP driving cycle. That could translate into about 150 miles in a U.S. EPA rating, competitive with base levels of the Nissan Leaf.

The Ioniq Electric will also get a notable bump in horsepower, from 120 to 134 hp. Hyundai also applied the Kona Electric's one-pedal driving system to the Ioniq Electric.

The company released other details about the updated model in Europe in January, and it's a pretty comprehensive refresh.

The whole new Ioniq lineup gets a new 10.25-inch center touch screen display that can connect two phones simultaneously to expand music and streaming options. Its cloud-based voice recognition system can understand six languages.

Sitting gracefully below the high-mounted touch screen, the climate control buttons have been redesigned

*continued next page*





with capacitive touch buttons in place of physical buttons.

Outside, the lineup gets new LED headlights and a new bumper with a gray fascia. The Ioniq Electric sports a new closed grille.

Hyundai will include automatic emergency braking with pedestrian and cyclist identification and active lane control as standard equipment, and the system now includes a Driver Attention Warning system.

The Ioniq also includes plug-in hybrid and hybrid versions. Those get a new Integrated Coasting Guide to help drivers maximize efficiency, plus a new predictive energy management system that takes terrain into account and adjustable regenerative braking settings.

The changes all sound worthwhile, and we can only hope that they make it to the U.S. soon.



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.



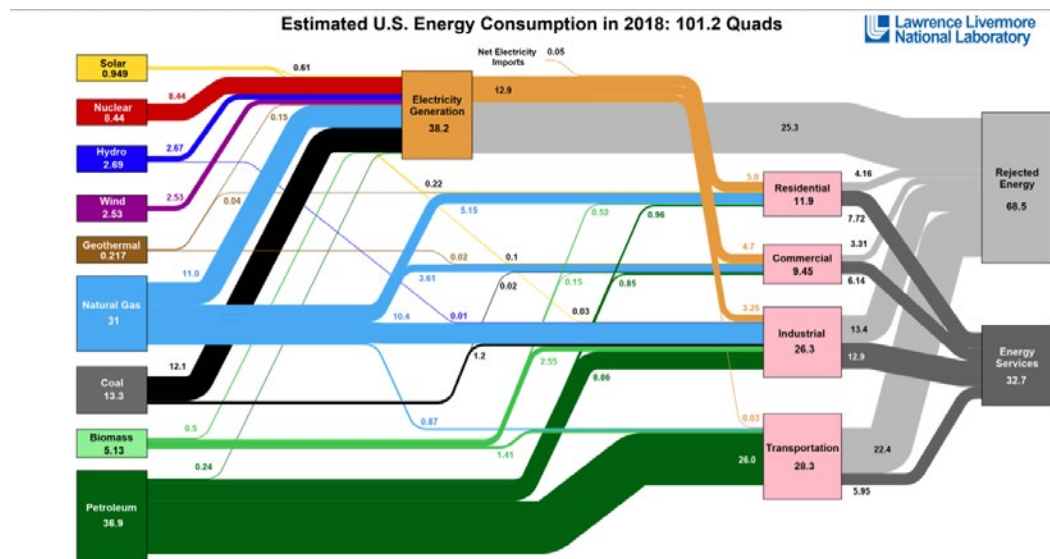
[https://www2.greencarreports.com/news/1122928\\_2020-hyundai-ioniq-electric-gets-more-range-and-power-faster-charging-in-europe](https://www2.greencarreports.com/news/1122928_2020-hyundai-ioniq-electric-gets-more-range-and-power-faster-charging-in-europe)

## Energy Flow Charts:

Charting the Complex Relationships among  
Energy, Water, and Carbon

### Energy, Water, and Carbon Informatics

Lawrence Livermore National Laboratory (LLNL) produced the first diagrams illustrating U.S. national commodity use in the mid-1970s. The most widely recognized of these charts is the U.S. energy flow chart. LLNL has also published charts depicting carbon (or carbon dioxide potential) flow and water flow at the national level as well as energy, carbon, and water flows at the international, state, municipal, and organizational (e.g., Air Force) level. Flow charts, also referred to as Sankey Diagrams, are single-page references that contain quantitative data about resource, commodity, and byproduct flows in a graphical form. These flow charts help scientists, analysts, and other



The 2018 energy flow chart released by Lawrence Livermore National Laboratory details the sources of energy production, how Americans are using energy and how much waste exists. (If you go to this page, go to "HOME" and click on this image to enlarge or download a PDF version). See and download the charts state by state.

decision makers to visualize the complex interrelationships involved in managing our nation's resources.

### Commodities

Computer models and simulations are essential tools for visualizing data, for predicting future trends in energy production and for discovering safe and reliable energy systems to support human needs. Energy informatic technology information for the following commodities are provided in a format suitable for management plans that optimize energy resources while protecting the environment. Flow charts show the relative size of primary resources and end uses in the United States.

The flow chart database is organized by commodity and can be searched by year, country, and state. Access to the database based on your home state for each of these categories is accomplished by drilling down by following the main URL, then selecting which commodity from the colored box, selecting the year, the country and state, finally pressing go. Raw data can be viewed but the ream of resulting data is overwhelming!

Energy

Carbon

Water

Energy/Water

<https://flowcharts.llnl.gov/commodities/energy>



# Powerline Approval Could Bring EV Drivers More Wind Power



By *Eric C. Evarts*

In the efforts of Green New Deal and electric car advocates, a new permit for power transmission lines may knock down one of the biggest hurdles to bringing more renewable power to electric cars.

Last week, a major new power transmission line from Wyoming to the Hoover Dam won final approval from Wyoming, the last of the states it traverses to approve it.

The transmission line is key for two reasons:

- Wind is the fastest growing source of renewable energy and the most likely source to provide large quantities of renewable energy. But the biggest source of wind is in the center of the country, while the biggest demand for electricity, especially to charge electric vehicles, is in California and on the coasts.
- In something of a virtual stress test of renewable grid capacity during this winter's polar vortex,

energy consulting firm Wood Mackenzie produced a study in February showing that one of the biggest obstacles to getting enough renewable power to homes and businesses during such a period of high demand is transmission capacity. Giant wind farms in the Midwest may not have enough transmission capacity to feed the coasts during high demand periods, just as abundant solar capacity in the Southwest may not have enough transmission lines to reach frozen regions of the upper Midwest in a deep freeze.

Battery and hydro storage can address some of this demand, but more transmission makes it easier.


The new \$3 billion power line, called the TransWest Express Transmission Project, is slated to be completed in 2023 and carry 3 gigawatts of power from two western Wyoming wind projects 730 miles to West Coast power markets. It will run from southwestern Wyoming through Colorado and

Utah to Nevada to connect to existing transmission lines at Hoover Dam.

The project already won approval from Nevada, Utah, Colorado, and the federal government.

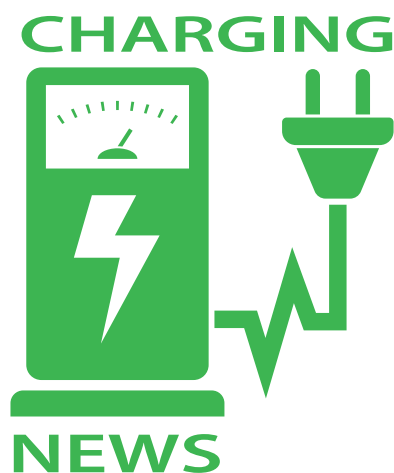
California, which has set a goal to be carbon free by 2045, currently gets 29 percent of its electricity from renewable sources, including about 10 percent each from wind and solar. It gets nearly another 15 percent from hydro power (some imported from the Pacific Northwest), nine percent from nuclear power, 34 percent from natural gas, and about four percent from coal.

In 2018, more than 10 percent of the cars sold in the state were plug-in or electric vehicles.

The new influx of wind power from the new transmission line should not only give a significant boost to the percentage of renewable electricity available to charge electric cars, it should also dramatically increase flexibility on the grid. 

[https://www2.greencarreports.com/news/1122777\\_powerline-approval-could-bring-ev-drivers-more-wind-power](https://www2.greencarreports.com/news/1122777_powerline-approval-could-bring-ev-drivers-more-wind-power)

# The Ultimate Electric Car Charger Guide



By Tom Moloughney

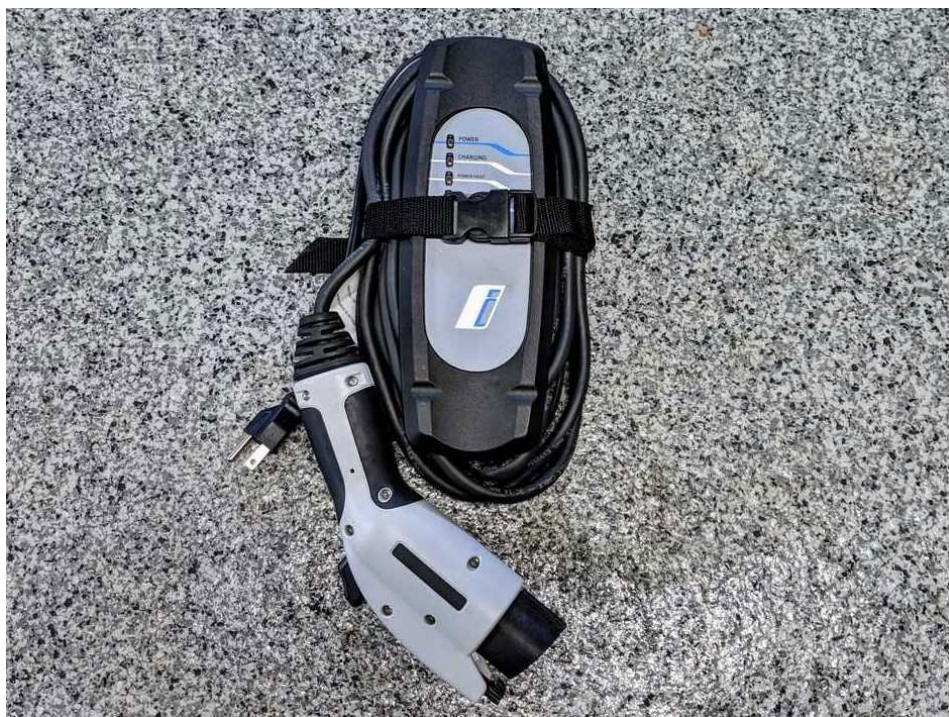
Only a few years ago there were very little choices for electric vehicle charging equipment. When I got my MINI-E in 2009, BMW partnered with ClipperCreek to supply the home charging station, or as BMW called it, the “Wallbox” to charge the fleet of 450 MINI-Es in service in the US. Tesla also reached out to ClipperCreek back in

2008 to supply the charging equipment for the initial Tesla Roadsters. Neither company really had any choice, because at the time ClipperCreek was pretty much the only company that could deliver this specialized EV charging equipment.

A lot has changed in 10 years in the

world of electric cars, and also in EV charging equipment. ClipperCreek is still around, and is still one of the top companies providing electric vehicle supply equipment, or “EVSE.” Electric vehicle supply equipment is really the proper term to use, but the general public really hasn’t warmed up to that, and most people call EVSEs “charging stations.” The reason charging station is not really the proper term is because the actual charging equipment is built into the car, and the EVSE really just provides a safe supply of electricity to the vehicle.

However, we’ll use the term “charging station” here since that’s what most people recognize the equipment as, and so those new to electric cars won’t get confused. It’s also important to note that this post is specific to the North American market. The electricity supply in Europe and most other parts of the world doesn’t use 120V as their standard household current as we do here, so there is no “Level 1 charging.” Also, in Europe the charging cable is often not tethered to the unit for Level 2 charging, and thus, the equipment is very different than what is used in North America. *continued next page*



A BMW Level 1 portable charger. These are provided with every BMW plug-in vehicle sold or leased. \*Notice a standard household plug is used.



## Level 1 or Level 2 – What's the Difference?

Every electric vehicle sold today comes standard with a 120V Level 1 portable charger. These chargers can be plugged into a simple household outlet, and don't require any special installation. Some manufacturers, like Tesla's cars for instance, come with a plug-in 120V / 240V Level 1/2 charger. These require a 240V outlet, which most owners need to have installed.

However, most manufacturers only provide a basic Level 1, 120V charger, and offer as an option, a higher-powered Level 2 unit for sale. In order to recharge their EV quicker, many owners choose to buy a 240V, Level 2 charging station and install it at their home. This goes for basically all electric vehicles other than Tesla. Tesla is unique in that they use a proprietary connector, that only they use.

Every other electric vehicle made today uses the same connector for Level 1 and Level 2 charging for that specific market. So, there's one plug for North America that everybody besides Tesla uses, and it's called the SAE J1772, and another plug that everyone uses in Europe called the Type 2. We mention this not to confuse the readers, but to assure them that any charging station they purchase in their native market will charge their electric car, they do not need to worry about buying the "wrong one." Additionally, Tesla vehicles can also use any Level 1 or Level 2 charging station because Tesla provides an adapter with every car. These adapters allow Tesla to use charging stations with the J1772 connector.

Level 1 chargers will deliver between three and five miles of range per hour to a typical electric car. For Level 2 chargers the rate increases to a range of between 12 and 60 miles per hour.



A lower-powered portable Level 2 charger. It's about the same size as a portable Level 1 unit, but can deliver much more power. \*Notice a NEMA 14-30 240V plug is used.

However, that number will be limited to how much electricity the car's onboard charger can accept. The car is always in control of how much electricity it takes in, so you won't damage the vehicle if you buy a charging station that can deliver more power than the car can accept. In fact, many people choose to buy a charging station that can deliver more power than their current EV can accept, so they'll be ready if their next EV can charge at a higher rate.

There are low powered Level 2 chargers that are small and portable. Many of these are limited to a power delivery of 16 Amps to 20 Amps. These units will charge a typical EV at a rate of about 12 to 18 miles per hour. We'll be doing a side-by-side comparison post here on those portable units soon, but today we're going to focus on the best choices for medium powered, wall-mounted charging stations.

These units typically deliver between 30 Amps and 40 Amps, and will charge

a typical EV at a rate of about 25 to 35 miles per hour. Most of today's wall-mounted Level 2 charging stations come in both hardwired and plug-in versions, which we'll discuss later. But before buying a Level 2 charger, there are a couple things you should consider.

## Considerations Before You Buy

- **Are you in control of your electricity supply?** If you own your home, then there's no issue because you can install your charging station without needing asking for permission. If you own a condominium, you will probably have to get permission from the association, which can be troublesome. If you live in an apartment and have a reserved parking space or garage, you'll likely need to get the landlord's permission before installing the charging station, and there may be a limit on how much power is available to you in the garage.

*continued on page 36*

# Charging Guide

*continued from page 35*

- **Does your electric service panel have enough spare capacity to allow you to install a dedicated circuit for the charging station?**

If you have any question about whether or not you have enough spare capacity, consult a licensed electrician to inspect your service to let you know if you do.

- **Where would you like it installed?** You should locate the charging station close to where the inlet for the connector on the car is, and make sure the cable on the charger is long enough to reach the inlet without stretching. Every EV has a different location for their charge port, so make sure you know where your charge port is located before installing your charging station.

Once you've confirmed that you can install the charging station and you know where you want it, it's time to decide which charging station to buy. There's many choices available today, and not all charging stations are created equal. Let's look at the different features that should be a consideration when deciding on which station is the right one for you.

**Power:** Level 2 charging stations typically deliver anywhere from 16 Amps to 80 Amps. This can make a huge difference in how quickly your EV charges. You probably don't want to buy an underpowered charging station, only to need to buy a more powerful at a later date. Even if your current EV can only accept 16 Amps (3.3kW) you might want to consider getting a more powerful unit, because your next EV will likely accept at least 32 Amps (7.7

kW) For that reason, we recommend getting a charging station that can deliver at least 32 Amps, preferably 40 Amps if you want to future proof your investment.

**Cable Length:** Some charging stations come standard with only a 16 foot cable. In our experience, that's not long enough for most people. We recommend making sure the cable length is at least 20 feet in length, with 24-25 feet being ideal.

**Safety Certified:** Since electric vehicle charging is a relatively new industry, there are a lot of small start-up companies making EV chargers, some of which haven't taken the time or expense to have the device safety certified by an established testing entity like Underwriters Laboratory (UL). These devices will be delivering a high amount of power to your car every day, and for many continuous hours. You want to make sure it has been fully tested and certified. We do not recommend buying any charging station that doesn't have the UL certification seal on it.

**Hardwired or Plug-In?** Hardwiring simply means the unit is permanently connected to the electric supply, so you cannot remove it without opening the charger up and removing the wiring. A plug-in unit isn't permanently connected to the electric supply, it simply plugs into an electrical receptacle.

There are a few advantages to having a charging station that plugs in, as opposed to permanently installed:

- You can unplug the unit and take it with you to charge at another location. Perhaps you have a 2<sup>nd</sup> home, or visit family or friends that live far away. You can take a plug-in unit with you on long trips,

but you cannot take a hardwired one. These aren't as small and as light as the lower powered Level 2 portable chargers, but they can be easily removed and taken to another location.

- Installation can cost less. Since all you need to have your electrician do is install a 240V outlet, the installation can be much less than if they have to hardwire and install the charging station.
- Since all you need is an outlet, you can have it installed before you buy the charging station, and have your garage ready to go when the charging station arrives. If you do this, make sure you have your electrician install a circuit that can deliver at least 40 Amps, 50 Amps would be even better.
- If there's a problem with it, and you need to have it repaired or replaced under warranty, you just unplug it and ship it back. If it's hardwired, you need to have your electrician come to remove it, cap the wires, and then come back to reinstall the new one.

## Outdoor Rated & Connector Holster

- Many people don't have a garage to park their EV inside, so their charging station has to be mounted outdoors. Make sure the station is outdoor rated, but that's not the end of the story. The charging stations usually have either a NEMA 3 or NEMA 4 rating. Both are acceptable for outdoor use, but NEMA 4 adds a little more protection and adds protection against a direct blast of water from a hose. This could be useful in areas that get blowing rain or wind-driven snowstorms.

*continued next page*



Some charging stations have a built-in or remote connector holster so the plug is protected while not in use. Other stations just direct the customer to drape the cable over the body of the unit and leave the connector hanging and unprotected. We recommend making sure the connector is properly protected when not in use. This will keep dirt, water and other contaminants from entering the connector and possibly damaging it.

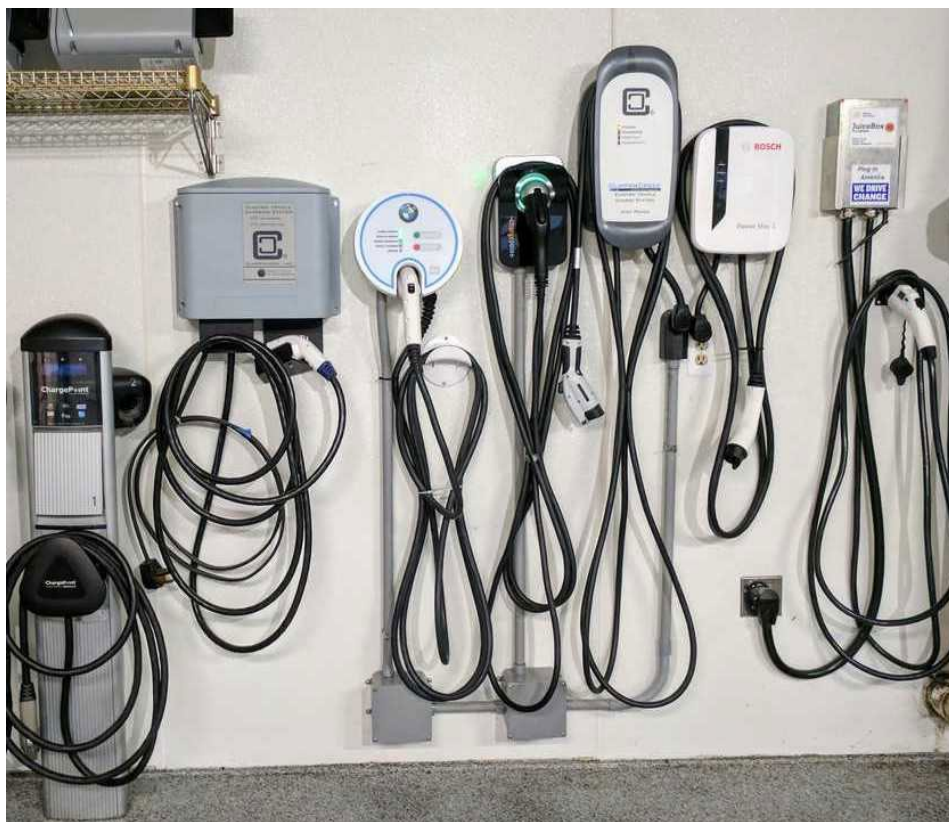
### Smart or Dumb?

A “dumb” charging station just charges the car, period. And for some owners, that’s all they care about. A smart charging station has the ability to connect to WiFi and allow the owner to monitor their charging, check the power being delivered, review statistics from past charging sessions and more. This allows the owner to see exactly how much energy the car is using, so they can calculate how much the car costs to power. Without this feature, an EV owner can only guess how much the car is costing them to charge.

Some smart chargers can perform other tasks, like connecting to Amazon Alexa for voice-control of your charging, communicating with your utility so you can charge your car when the electricity provided is the “greenest” available, and even load-share so you can have two chargers on one dedicated circuit. If you want options like these, or you’re kind of a data geek, you’ll definitely want a smart charging station.

### Cost

You can expect to spend somewhere between \$400 and \$1,200 for a high quality, safety certified electric vehicle charging station. However, spending more doesn’t always get you more. We’ve also noticed many of the charging stations listed below often



A variety of wall-mounted Level 2 charging stations

have special offers and discounts, so shop around a bit before you make a purchase.

For some, the least expensive charger that’s built well and has a good warranty is the right choice, and we have a top pick recommendation that fits that profile. For others, having the ability to review charging session history, calculate the exact cost of charging, using Amazon Alexa to voice control your charging and other smart-charging options are worth the extra cost, and we offer our top pick for these higher end smart chargers also.

### Recommendations

The charging stations below are some of the most popular on the market today, and we can confidently recommend all of them. They are all safety certified and have very high customer-satisfaction

ratings. After considering all of their features as well as the cost, we ranked them in descending order.

However, it’s important to note that all of the units here are a solid choice if they meet your personal qualifications. In our opinion, all of the chargers listed below are better choices than many other charging stations on the market today.

And our top recommendation is...

*continued on page 38*

# Charging Guide

continued from page 37



Juice Box 40

**#1: JuiceBox Pro 40 by eMotorWerks:** The JuiceBox Pro 40 is our Top Pick for a number of reasons. First, it delivers up to 40 Amps of power, while the main competition is limited to 30 or 32 Amps. If you don't want the extra power, the JuiceBox Pro 32 is available for about \$80 less and has all the features of the Pro 40. It comes standard as a plug-in unit, it has a NEMA-4 rated outer case for extra protection from the weather, a 24-ft cable is standard, and it's WiFi-connected with an app that has the most smart-charging features available. You can de-rate the power delivery, set reminders and notifications, and even use Amazon Alexa voice control.

The JuiceBox is also the only EVSE on the list that allows load-sharing, which allows the owner to use one dedicated circuit for multiple units. This can be very useful for two EV families. Basically, it checks all the boxes. It costs less than the other stations yet has more features which is why it earns the top spot. Also, the JuiceBox along with the ChargePoint Home are the only Energy-Star certified units on the list.

Cost: \$579.00 (The 32-amp **JuiceBox Pro 32** is \$499.00)



Wall Mounted  
Holster Included

ClipperCreek HCS-40

**#2: ClipperCreek HCS-40P:** ClipperCreek has been making EV charging equipment longer than any of other company, and has built a reputation for making extremely durable, reliable charging stations. The HCS-40 is a “dumb” charger and is available hardwired or as a plug-in unit. The HSC-40 can deliver up to 32 Amps, and comes standard with a long 25-ft cable. The outer casing is NEMA-4 rated for extreme weather and like the JuiceBox, it comes with a remote connector holster which allows the owner to locate it wherever they choose. Many owners like this option, so they can locate the holster on the wall directly opposite their charge port, even though the charger may be further away.

The HCS-40P is physically the largest unit on the list, which may be a consideration if you have limited wall space. ClipperCreek's reputation for high-quality & durable units is well earned, and they have a very loyal customer base. I've personally used their products for years, and have never been disappointed.

Cost: \$589.00

*continued next page*





ChargePoint Home 25

**#3: ChargePoint Home 25:** ChargePoint manages the largest network of public charging stations in the US. They entered the residential charging stations market in 2015 with the introduction of the ChargePoint Home. The Home is a WiFi-connected smart charger and offers real-time charging data, the electricity cost of each session, as well as previous charging history. It is available as a plug-in, as well as hardwired unit. Like the JuiceBox, you can sync the Home with Amazon Alexa to remotely start, schedule and stop charging sessions and it's also Energy-Star certified. The ChargePoint Home delivers up to 32 Amps, and has a NEMA-3 outer enclosure, that is suitable for outdoor use but offers a little less protection from the elements than some other units that are NEMA-4 rated. There's a built-in connector holster with a nice LED light to help center the connector when holstering it.

The ChargePoint Home is the smallest and lightest unit, with a very sleek design and pivoting connector holster in the center of the body. You won't be disappointed if you choose to buy the ChargePoint Home.

Cost: \$674.00



Siemens VersiCharge™

**#4: Siemens VersiCharge 30GRYU:** The Siemens VersiCharge is the least expensive charger on the list. It's a basic, no-frills "dumb" charger that comes in a plug-in version as well as hardwired. Like the ChargePoint Home, it has a connector holster located on the center on the unit and is available in different cable lengths. It has a NEMA 4 rating for top weather protection. The standard cable length is a very short, 14-feet, so if you order the Siemens VersiCharge, make sure you order the cable length that you need. If you're in the market for the most economical Level 2 unit that's safety certified, plugs in and has a NEMA 4 rating, then this might be your best choice. For that reason, it's our Top Pick for a low-cost basic, charging station.

Cost: \$458.94

*continued on page 40*

# Charging Guide

*continued from page 39*



AeroVironment/Webasto

## #5: AeroVironment/Webasto EV Charger:

Earlier in the year, AeroVironment sold their EV charging division to Webasto, which is the reason for the dual-name above. AeroVironment had been making this popular charging station since 2010, and it has proven to be an extremely reliable unit. BMW, Ford, Nissan and others all chose AeroVironment at one time or another to be their official charging partner and used this unit. It is a “dumb” charging station and is available in hardwired or plug-in versions and delivers 32 Amps. Like the ChargePoint Home, the outer casing is NEMA-3 rated, so it has a little less protection from the elements than the other three units on this list. This charging station was once a top choice, but it hasn’t upgraded or improved in eight years, so the competition has passed them. However, it’s still a solid choice if it fits your needs and budget.

Cost: \$589.00

## Lower Cost Portable Options

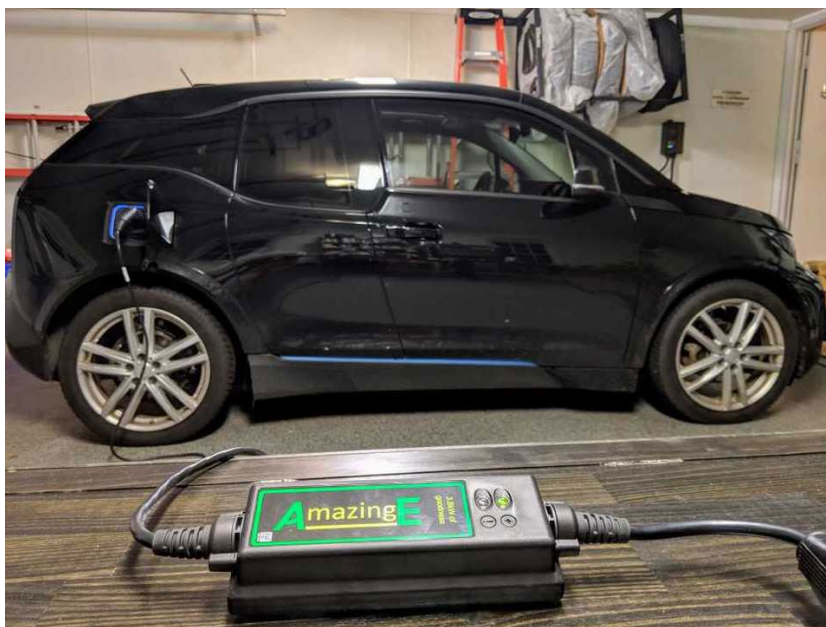
We recently posted our Ultimate Buyers Guide to Level 2 Chargers, that included our Top five picks

for wall-mounted, medium power (30 Amps to 40 Amps) Level 2 charging stations. We’re now turning our attention to lower-powered, portable Level 2 EVSE units, and have selected the ClipperCreek LCS-20P, the AmazingE, and the AeroVironment (now Webasto) TurboCord for our side-by-side comparison.

## Charging Station News

These devices offer a middle-ground between the standard 120 volt, Level 1 chargers that most EVs come standard with, and a typical wall-mounted EVSE like the ones we compared in our Ultimate Buyers Guide. These units are especially well-suited for those customers who want to charge at multiple locations (home, work, a relative’s house, etc) with only one unit, and also for those who don’t have the electric capacity to install a higher powered unit at home. Also, they allow PHEV owners to fully recharge their batteries in a couple of hours, instead of the 10 to 15 hours that it would take on Level 1. PHEV owners may not feel the need for a more powerful, wall-mounted unit since their car has a smaller battery, and a lower charge rate than a pure EV.

The ClipperCreek and Webasto units have been available for years now, and have long since established themselves as high quality, dependable units. However, these well known favorites aren’t inexpensive, and have recently been challenged by a number of new entries to the market, many of which are offered at a significantly lower price point.



AmazingE

One example of the new, lower-priced units is the AmazingE. The AmazingE has been available for a little over a year now, and seems to have a relatively high customer satisfaction rate. It has an Amazon rating of 4.8 out of five stars, and the reviews on many online EV forums are mostly satisfactory.

*continued next page*



## High Powered or Low Powered? That Depends

Before we start the comparison, we'd like to talk a little about the power delivery of these units. Some manufacturers like to boast about the charging speed of these units in their advertisements, and it can sometimes get a little confusing. We've seen claims of "charges three times as fast" and "lightning fast" being used, and some people new to EVs may not fully understand how EV charging works. Some EVs can only accept 16 Amps of power, while others, like the new Audi e-Tron for instance, can accept up to 40-amps. Therefore, make sure you know your car's charging capabilities before you purchase charging equipment, or you may not pair the correct device with your car's charging ability, and your driving needs.

Most EVs today come with a 120V portable EVSE. Some EVs however, come standard with a portable Level 2 unit, and this trend seems to be increasing. Tesla for instance, provides a 120V/240V Mobile Charger with every car they sell. Therefore, Tesla owners typically wouldn't be in the market for a portable unit like those we're comparing here. Audi is also going to be providing a high-powered (40 amp) portable 240V EVSE with every e-Tron, so it's possible that more OEMs may start to follow Tesla's model of including a 240V EVSE with the car.

If your EV comes with a portable 240V charger, then you probably have no need for another one. In that case, you're more likely to be in the market for a higher-ampage wall mounted unit. As for charging speed, it is true that a 16 Amp portable 240V EVSE will charge an EV at nearly three times as fast as a 120V, 12 Amp unit as the ads claim. Just make sure you know exactly what charging equipment came with



ClipperCreek includes a wall-mounted connector holster with every EVSE. Webasto includes a wall-mounted cable organizer and a carrying case. AmazingE includes two large grocery-style bags for storing and transporting the unit.

your EV before making a purchase, or you may end up buying something that isn't really better than what you already have. The advertisements that claim their products will "charge your car three times faster" don't always tell the whole story.

There are also many EV owners who may be better served buying a 32 Amp wall mounted unit for only a little more than the cost of many of these lower-powered, portable 240V units. These wall-mounted chargers are twice as powerful as the 16 Amp portable units we're discussing here today. Therefore, "powerful" is a relative term, and we urge customers to do their due diligence before purchasing any EV charging equipment.

Part of your research should be determining whether or not it's even possible to add a dedicated 40 Amp or 50 Amp circuit necessary for a 32 Amp or 40 Amp higher powered wall unit to your home. Many homes, especially older ones, cannot add a 40 Amp circuit without an entire service upgrade that

costs thousands of dollars. Those in that position may have no choice but to settle for a lower-powered 16 Amp 240V EVSE. All three of the units in our comparison can deliver 16 Amps of power, which will charge a typical EV at a rate of rough 11 to 15 miles of range per hour, depending on how efficient the vehicle is.

One last consideration is the plug. While they all use the same industry-standard J1772 connector to plug into the car, each of the three units in our comparison uses a different wall plug on the other end. The variety of different types of outlets can be a big problem for those who want to take these small, portable units on the road with them. It's not an issue for home charging, because you can install the outlet you need at home, your place of work or maybe even at a relative or friend's house.

However, trying to find an available NEMA 14-30 outlet at the local shopping mall, or a NEMA 6-50 at a

*continued on page 42*

# Charging Guide

*continued from page 41*

rest stop along the highway can be challenging. The NEMA 14-50 outlet seems to be the most popular, and that's probably because Tesla uses it for their Mobile Charger. Tesla has had them installed for destination charging in many locations, as have Tesla owners. If it's your intention to use your portable 240V EVSE at multiple locations and opportunity charge whenever possible, we'd recommend investing in an array of adapters, definitely including a NEMA 14-50, so you're ready for any available 240V outlet that you come across.

## The Contenders

**ClipperCreek LCS-20P:** ClipperCreek has been making electric vehicle charging equipment at least as long, if not longer, than anyone in the business. Many manufactures have turned to them for the standard Level 1 charging equipment that is supplied with their electric vehicles. The LCS-20P we're using for the comparison is the heaviest of the three and weighs six lbs. However, it also has a standard 25-foot cable, which is five feet longer than the other two units. It has a built-in cable management by coiling the cable around the unit, and securing it in place with a locking strap. There are four holes (two on top and two on the bottom of the unit) which allow for easy wall mounting and removal if desired. The unit is NEMA 4 rated which is good for outdoor use even in extreme weather.

ClipperCreek includes a wall-mounted connector holster in the box with all of their EVSE, which is especially useful if you're going to be charging outside. We at *InsideEVs* recommend always holstering or capping your EVSE

connector when not in use to prevent dust, water and other contaminants from infiltrating the connector head. Unlike Webasto or AmazingE, ClipperCreek doesn't provide a carrying case or bag with the unit. However, as mentioned above, it does have a nice cable management system to make handling and transporting it easy.

One notable point is that ClipperCreek is the only company that allows their customers to choose which plug they would like on the unit. They offer the LCS-20P with four different plug configurations: NEMA 14-50, NEMA 6-50, NEMA 14-30 or NEMA L6-30. By allowing the customer to choose which plug is used, the customer could potentially save up to a couple hundred dollars by not needing to install a new outlet, or needing to upgrade the wiring in the existing circuit. We got our unit in a NEMA 14-50 plug configuration because that seems to be the most popular. Plugshare even has a 14-50 plug option in their search criteria,



so you can search a destination for available outlets. You can't do that for the other 240V plug configurations.



EV Charging Station Buyer's Guide Series: Staying Safe V2 Video (less than 3 minutes)  
[https://www.youtube.com/watch?v=\\_TFgeRBLyls](https://www.youtube.com/watch?v=_TFgeRBLyls)

*continued next page*



## Webasto TurboCord

The **TurboCord** was developed and sold by AeroVironment until earlier in 2018 when Webasto purchased AeroVironment's EV charging business. AeroVironment specializes in "Unmanned Aircraft Systems and tactical missile systems used for surveillance and reconnaissance by the military," so EV charging equipment should be pretty simple for them. They did in fact, prove their engineering expertise when they developed and introduced the TurboCord in 2014.

The TurboCord is tiny, and weighs only four lbs. It's so small and light, that it plugs directly into the outlet, so there's no need to have any kind of wall-mounting system. It has a 20-foot cable and the unit has a NEMA-6 rating, which is not only good for all kinds of weather, including direct hose spray like the NEMA 4 rated ClipperCreek and AmazingE, but it is also rated for up to 30 minutes of complete immersion in up to a meter of water. It's the smallest, lightest and highest NEMA-rated unit of the three. Webasto includes a wall-mounted cable hanger in the box, but not a connector holster.

The TurboCord is also the only 120V/240V unit of the three in our comparison. It's worth noting that you can get the TurboCord in a dedicated 240V configuration for \$389, which is \$110 less than the dual voltage version we have that retails for \$499. To switch from 240V, to 120V charging on the dual voltage unit, you simply remove the 240V adapter and locking clip, and plug the unit into any simple household outlet.

When the unit is charging on 120V, it will deliver up to 12 amps (1.4kW) of power which will charge a typical EV at about three to five miles of range per hour. Add the NEMA 6-20, 240V



TurboCord Demo v.2.: World's Smallest UL-listed Dual-Voltage Plug-In Electric Vehicle Charger Video

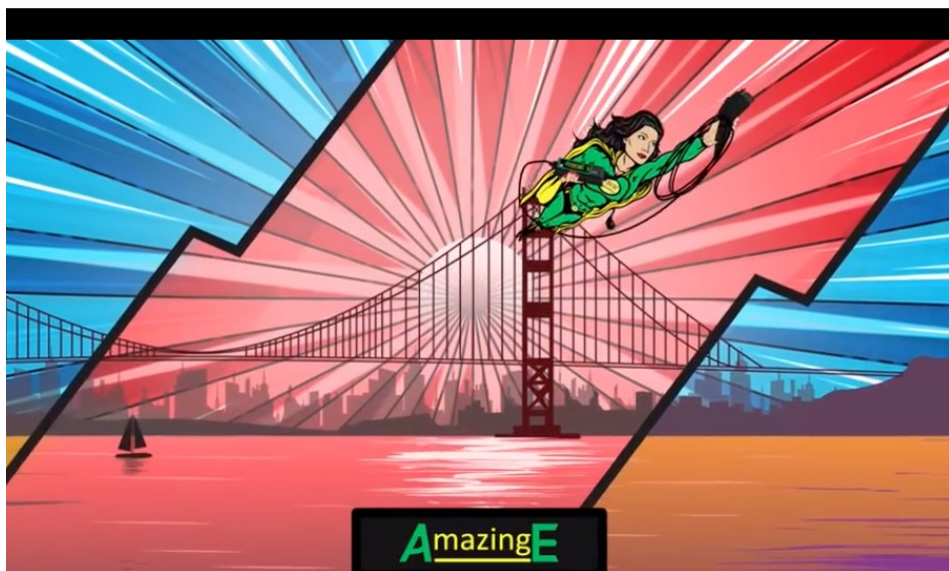
adapter, and the charge rate jumps up to roughly 11 to 15 miles per hour. Having the ability to switch between 120V and 240V is desirable, because the one unit is all you ever need to charge at home or take with you on the road.

## AmazingE

The **AmazingE** is the lowest cost choice of the three, and by a significant amount. At only \$219.00 it's a good

value for a solid 240V portable charger. Like the ClipperCreek unit, it's NEMA 4 rated, which is fine for use in all outdoor weather conditions.

Unlike the two other units, there's no cable management system. The only thing included for cable management is a small Velcro strap attached to the cable. As for wall mounting, there are two brackets on the rear of the unit



AmazingE Girl Fights for YOUR Safety – AmazingE EV Charging Station EVSE video

*continued on page 44*

# Charging Guide

*continued from page 43*

which will slide over screw heads to hold it on a wall. It works, but it's not as easy or as secure as the ClipperCreek's mounting process. There is no connector holster included but their website does have a connector holster available for \$19.00. It's actually the exact same holster that's included with the ClipperCreek unit.

In fact, the AmazingE is sold through, serviced by, and uses components made by ClipperCreek, and that offers buyers a higher level of confidence, since ClipperCreek is an established brand with high customer satisfaction. As mentioned above, AmazingE has started off well, and currently has a very high 4.8 of our five-star rating on Amazon, which is part of the reason why we chose to include it in this review, instead of one of the other new-to-market portable 16 Amp EVSE.

On the negative side, AmazingE only offers an 18 month warranty, which is half as long as what ClipperCreek and Webasto offers on their products. That's a significant short coming in our opinion, and buyers should definitely take warranty length into consideration when making a purchase decision. It also uses a NEMA 14-30 plug which aren't very common in many public places. We'd recommend getting a NEMA 14-50 adapter if you have an AmazingE and plan to charge on the road at times.

## Other Considerations

As mentioned above, there have been a lot of new entries in the portable 240V EVSE market in the past couple of years. The units selected for this comparison are, in our opinion, some of the better choices available today.

## By the Numbers:

	ClipperCreek HCS-20P	Webasto TurboCord	AmazingE
Power:	16-amps @240v	12-amps @120v 16-amps @240v	16-amps @240v
Weight:	6 lbs.	4 lbs.	4.6 lbs.
Cord Length:	25-feet	20-feet	20-feet
Dimensions:	11"L x 4"W x 3"D	5.5"L x 3.7"W x 1.8"D	9.2"Lx3.5"Wx2"D
NEMA Rating:	NEMA-4	NEMA-6P	NEMA-4
Plug:	(NEMA 14-50, 6-50, L6-30 or 14-30)	NEMA 6-20	NEMA14-30
Connector Holster:	Included	No	Optional
Cable Mgmt:	Built-in w/locking strap	Included - wall mounted	Velcro Strap
Warranty:	3 Years	3 Years	1.5 Years
Price:	\$395.00	\$389.00(240-v only) \$499.00 (120/240v)	\$219.00

*InsideEVs* also reached out to Duosida to see if they wanted to be included in this comparison test, but they didn't respond back. Duosida offers a low cost (sub-\$200) portable 120V/240V EVSE that is marketed and sold under four or five different names (Zencar, EVChargeSolutions, BougeRV, OrionMotorTech and more). However, this unit seems to have many unfavorable ratings on Amazon, with customers complaining that their units failed within the first year of use. Also, the Duosida website states that the product is only covered by a 30-day warranty, so buyer beware.

Another consideration worth mentioning is the fact that ClipperCreek offers a variety of different power level options to meet the customer's needs. We focused on 16 Amp unit here, because 16 Amp units are the most popular, and what the majority of the

competition is offering. In addition to offering four different plug configurations, ClipperCreek also offers their LCS models in power ratings of:

- 12-amps (2.8 kW) – Delivers about 8-11 miles of range per hour
- 16-amps (3.8 kW) – Delivers about 11-15 mph (The model used in our comparison)
- 20-amps (4.8 kW) – Delivers about 14-19 mph
- 24-amps (5.8 kW) – Delivers about 17-23 mph

## Recommendations

Choosing the right Level 2 portable EVSE for your needs is a personal decision based on budget, the charging capability of your EV, the power you have available at your house, the daily driving range you need, and perhaps the outlets you have available for you

*continued next page*





The TurboCord's 240v adapter pulls off to reveal a simple 120v household outlet

to use at work or other locations you frequent.

The three units we present here are all very capable, well made devices and *InsideEVs* feels comfortable recommending all of them. With that said, it would be hard to say that ClipperCreek isn't our favorite brand for portable EV charging for the following reasons:

- They offer units in four different power levels, and all come in four different plug configurations
- All of their units come with the industry best 25-foot cables
- All of their products come with a robust three year warranty
- They have built-in cable management, and include a wall-mounted connector holster
- ClipperCreek has a long history of making top quality products and great customer service

But that's not to say that someone might be looking for the least expensive, well-

built 16 Amp portable EVSE available and find ClipperCreek's \$395.00 price a little too high. Those people may find the \$219.00 AmazingE the right fit for them (provided they can look past AmazingE's kitschy cartoon advertising!).

The TurboCord's ability to switch between 120V and 240V is a feature that others will put a premium on. It's small, light, and comes with a nice carrying case, but at \$499 it's more than twice the price of the AmazingE. On the other hand, the warranty is twice as long as the AmazingE's, and it's the only unit of the three that's NEMA 6P rated, which means it can be fully submerged in up to a meter of water for at least 30 minutes and still operate and quality like that does come with a price.

While there's no one-size-fits-all when buying electric vehicle charging equipment, there are some important features and other considerations when

shopping for one. First, make sure your home can accommodate the electric demand the unit you want needs. Make sure it's paired well with the amount of electric your EV can accept (the car always dictates how much power it will accept, so you don't have to worry if you get a charger that can deliver more than your car's maximum charge rate). Decide which plug you want, and get adapters if necessary. Check to see if the unit is safety certified and that it has at least a NEMA 4 outdoor rating for adverse weather conditions. Make sure the cable is long enough for your needs, and that you have a holster or cap for the connector when not in use. Finally, don't rush to buy a unit that is a few dollars less without thoroughly checking product reviews and ratings.

There are a lot of new entries to this market, and many of these units aren't built as well, and don't have the proven track record as the three we used for this comparison. Since these devices will likely be used every day and for many continuous hours, and if they aren't well-made you could run into serious problems. Saving a few bucks today could be very costly down the road, so do your homework before buying an EVSE, and certainly make sure it's safety certified and market tested.



**Tom Maloughney** has long advocated for EVs and has been driving electric since 2009. A former director at Plug in America, Tom currently works with dealerships to increase their plug in vehicle sales. Tom manages public charging stations he had installed at a strip mall in Montclair, NJ.

<https://insideevs.com/news/344002/charger-guide/>

# SemaConnect Releases Series 5 Smart EV Charging Station for Multifamily Applications



By Bethany Villarreal

SemaConnect, the leading provider of electric vehicle charging stations to the North American commercial and residential property markets, announces the release of the Series 5 Personal Electric Vehicle Charging Station for multifamily applications. With a lower price point and new network features, the Series 5 is the perfect station for apartments, condominiums, and Home Owners Associations with dedicated parking spaces for residents.

With over 1 million electric vehicles on the road, and 80% of charging done at home, the time is now for multifamily properties to invest in EV charging. The Series 5 is a new addition to the SemaConnect smart charging product lineup, which also includes the Series 6 charging station for shared use. Both offer best in-class warranties, Energy Star certification, optional cable management system, and network capabilities that make SemaConnect charging stations truly smart.

“We are excited to bring the Series 5 Personal Charging Station to multifamily communities across North America. Our clients are looking for the best EV charging stations

for their tenants with assigned parking. Combined with new updates to the SemaConnect Network management platform for station owners and drivers, the Series 5 helps property managers provide the latest green amenity without headaches,” said Mahi Reddy, CEO at SemaConnect.

“We’re also excited to introduce a new monthly billing options for Series 5 charging stations on the SemaConnect Network platform, so property managers can bill drivers monthly for station access and energy usage,” Mr. Reddy continued. “With the addition of the Series 5 to our lineup, it’s even easier to add charging as a service for tenants and guests.”

Features of the Series 5 Personal Charging Station include:

- Sleek, compact “no assembly required” design
- J1772 connector
- EnergyStar certification
- Interactive LED lights
- Wireless communications
- Monthly driver billing
- Private access for multifamily tenants
- Smart card authentication

<https://www.semaconnect.com/blog/semaconnect-releases-series-five-smart-ev-charging-station/>



## Keep Up on all Auto Shows & EV Related Conferences

### US and International Events

**EVENT TECH CONFERENCE**  
05/14/2019 - 05/16/2019

**GAIKINDO INDONESIA INTERNATIONAL  
AUTO SHOW** 07/18/19 - 07/28/19

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

**ALTCAR EXPO SACRAMENTO**  
05/15/19 - 05/17/19

**AUTONOMOUS VEHICLES, DETROIT,  
MICHIGAN** 08/21/19 - 08/23/19

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

**POWER 2 DRIVE - MUNICH, GERMANY**  
05/15/19 - 05/19/19

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

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

**AULT PARK CONCOURS D'ELEGANCE**  
06/07/19 - 06/09/19

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

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

**CONCOURS D'ELEGANCE OF AMERICA**  
06/26/19 - 06/28/19

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

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

**AUTOEXPO AFRICA- KENYA**  
07/18/19 - 07/20/19

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

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



## Driving Forward With Your Help

We have just finished the first ever **Drive Electric Earth Day (DEED)**. By all accounts it was a huge success. There were 188 registered events, more than 100,000 attendees, over 1,700 test drives and more than 240 event organizers. Through our chapters we played an outsize role. By way of example only our San Diego Chapter had eight events, and Sacramento 14. In fact, DEED events took place in 44 states and five countries. In a few months, we will be participating in National Drive Electric Week, again across our country. We hope you participate in these events through our many chapters.

We are committed to the formation of new chapters throughout the country to advocate for the widespread adoption

of EVs. However, start up costs for new chapters can be one to two thousand dollars, or more. In the past members have paid these costs out of their own pockets. The EAA has now started assisting new chapters with these start up costs. In addition we are working on programs to certify members to be EV educators to work with the public and car dealers.

We are a grass roots organization, with no paid staff, no CEOs, and no professional fund raisers. We believe that is part of our appeal. However, we need your help to keep driving forward. You may ask that with all the Tesla's being sold is there a need for this. The answer is yes. There are still numerous myths and outright falsehoods being presented about EVs. In addition we

need to work with government and private parties to insure the build out of a robust charging infrastructure for EVs.

We ask that you contribute whatever amount you are comfortable with to EAA, whether it be the equivalent of one month of Netflix rental (\$11), a weeks worth of your favorite coffee beverage (\$21), a dollar a day for the month of June (\$30). No amount is too small or too large! Remember we are a 501(c)(3) non profit corporation so your donations are tax deductible to the fullest extent permitted by law.

**Please click on the link below to make your contribution, and thank you for your help.**



[https://eaa-1967.clubexpress.com/content.aspx?page\\_id=305&club\\_id=222684&item\\_id=4348](https://eaa-1967.clubexpress.com/content.aspx?page_id=305&club_id=222684&item_id=4348)

# 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

### Tesla Gigafactory 3 in Shanghai, China



This is a timelapse of the construction progress of Tesla's Shanghai factory where fabrication of Model 3 and 2170 cells will soon begin. Taken from a drone, using the same coverage sweep — it repeats at intervals of three, then two, and finally about one week each time. The rapid work is apparent and completion is scheduled for end of May 2019. Then production machinery will be installed, wired, tested and brought on-line during the next seven months for production of vehicles by end of the calendar year!

<https://twitter.com/i/status/1125438819149287424>

### All-solid-state batteries – Tokyo Tech



Tokyo Tech Research presents “All Solid State Batteries” with Dr. Kanno whose investigation's at the atomic level reveal new directions. If you're not sure what a solid state battery is, this five minute short can shed much light on some of today's limitations and how they are being addressed. With graphics, a good understanding of the unique tunneling structures discovered can be grasped, and the merits of LGPS sulfide solid electrolyte-based products better appreciated. What was learned provided them with hints on how to further improve performance. Last year, scholarly papers on the subject (such as <https://www.nature.com/articles/s41467-018-06123-2>) detailed additional advances, however, these highly complex and theoretical reports mean much laboratory research and simulation remains before we can capitalize on this in products. But future remains bright for advancements.

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

### Gamechanger: How Far Can Batteries Go?

**Stanford ENERGY Global Energy Forum**

**Lithium Ion Batteries**

Graphite Anode: 370 mAh/g

$\text{LiNi}_{1/3}\text{Mn}_{1/3}\text{Co}_{1/3}\text{O}_2$  Cathode: ~200mAh/g

Conductive additive  
Binder  
Current Collector  
Separator  
Electrolyte

$\text{Li}^+ + e^- \rightarrow \text{LiC}_6 \rightarrow \text{LiC}_6 + e^- + \text{Li}^+$   
 $\text{LiCoO}_2 \rightarrow \text{Li}^+ + e^- + \text{CoO}_2$

(Courtesy of Venkat Srinivasan)

This Stanford Precourt Institute recording from Nov. 2018 is a rapid fire presentation by Yi Cui. While his English is somewhat rough - he clearly overviews where things are headed, based on the past few years of discoveries which hold promise. The technology is there, and all the pieces are aligned.

[https://www.youtube.com/watch?v=OY2C\\_SshyeQ](https://www.youtube.com/watch?v=OY2C_SshyeQ)

### When Engineers Become Whistleblowers

*They're often the first to notice waste, fraud & safety issues*  
By Ralph Nader

**Did you know?** “It was a Caltech professor, Arie Jan Haagen-Smit, not GM engineers or chemists, who proved in the 1950s the connection between motor vehicles and the lethal photochemical smog over the cities and suburbs of California. This led to smog-control regulations and ethical and legal foundations for industrial air pollution controls.”

*Ralph Nader is a consumer advocate and is the author of the recent books Breaking Through Power: It's Easier than We Think and How the Rats Re-Formed the Congress.*



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

### Vintage Mercury Tesla-Powered Icon “Derelict” Hot Rod at SEMA!



Jonathan Ward, CEO and Head Designer at ICON a global leader in specialty automotive vehicle design which revisits vintage automotive design in a modern context, maintaining the beauty and grace of vintage with the performance and reliability standards of modern vehicles. Here he shows off his one-off conversions, a 1949 Mercury four door sedan, powered by his transplanted Tesla P85 battery, complete with Rinehart Motion Systems BMS, a custom ‘period correct’ display, dual motors etc. This interesting project was done for a client who clearly has deep pockets. Much innovation is included, such as the crank windows activate electric mechanisms on all four.

<https://www.youtube.com/watch?v=jVNb6ywH000>

### Kymera Floats Fast, Lightweight and Powerful Electric Personal Watercraft

By Paul Ridden

Jason Woods began his quest to build an inexpensive and easily hauled personal watercraft way back in 2004. He introduced us to the Kymera jetboard in 2011, which went electric the year after and launched on Kickstarter in 2013. In 2016, we spent some time on the water with the body board, and now the Kymera K-X2 has been announced.



The latest addition to the Kymera product line – which will include a battery-powered kayak and an electric surfboard, as well as the body board – is billed as “faster and more lightweight than any competing product.”

Full specs are a bit on the light side, but we do know that 10,000 watts of all-electric power will zip the K-X2 personal watercraft up to 35 mph (56 km/h). And the company reckons that water babies will get about an hour of mixed use per charge of its removable battery, which is compatible with all other Kymera products.

The 84 x 40 x 26 inch (213 x 101 x 66 cm) wave rider weighs in at 70 lb (32 kg) and can split in two for ease of transport in cars, SUVs and trucks – one part tipping the scales at 45 lb and the other at 25 lb.

The K-X2 will initially be available to early adopters for US \$5,995, with shipping expected to start later this year or early next. Once in production, buyers will need to cough up \$6,495. Video available at the URL below.

<https://newatlas.com/kymera-k-x2-personal-watercraft/59674/>



The Kymera K-X2 features 10,000 watt of all-electric power that will see it zip up to 35 mph (Credit: Kymera)



## Welcome to Membership in The Electric Auto Association!

*Educating and Advocating for EVs since 1967*

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

### Membership Dues:

Regular Member: \$35

### Supporting Members:

Charged Up: \$60

Supercharged: \$120

Supercharged Plus: \$240

High Voltage: \$500

### Benefits and Bonuses

12 months of full color, 40+page E-Magazine "Current EVents"(CE)  
Chapter meetings, speakers, meet EV owners,.  
Help increase public awareness by volunteering.

### In addition to the above:

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

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

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

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

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

## Join Today!

[www.electricaauto.org](http://www.electricaauto.org)





# Sacramento Offering DC Fast Charging at Curbside!

By Guy Hall, SacEV

A recent collaboration working with EVgo to design and construct a public curbside high speed charging plaza is a first in California. Three high speed 150 kW and three 50 kW DC fast charging stations along the curb border the 20 acre city Southside Park with its swimming pool, par course, lake, children's playground, and picnic areas. These activities can match the dwell time for charging sessions.

Sacramento determined the critical nature of curbside charging provides highly visible stations with easy street access. While it may sound simple, the placement of private infrastructure and right of ways on any public property typically brings in massive amount of bureaucratic time requiring changes to city ordinances and a significant approval process. Rather than providing this as a one off, special project, the City of Sacramento decided to be one of the first in the country to establish a city policy, processes and ordinances to support, encourage and accelerate local EV adoption with curbside charging.

Jennifer Venema, Sustainability Program Manager, Sacramento City said, "We are very excited. It's about increasing access to new technology to all our communities. It's a very significant step forward. We had a great partnership with EVgo, which made it possible. We are thrilled with the result.

Alberto Ayala, Air Pollution Control Officer and Executive Director of the Sacramento Metropolitan Air Quality Management District (SMAQMD) had this to contribute:

"We understand what the barriers are to the electrification of transportation. One of the principle barriers is charging



SMUD Board President Director Dave Tamayo, filling up a SMUD Bolt EV with the new EVgo CCS DCFC. The precise location of these chargers will soon be on Plugshare.

infrastructure. The fact that you have the infrastructure now in the ground, goes a long way for removing these very formidable barriers. Let us not miss the innovation of having it curbside, which is an issue that we always grapple with. I think this is fantastic. We're very excited to see this here."

Ayala continued by pointing out the impact curbside charging has enabling EV ownership for residents without home-based charging.

"Thinking outside of the box to address apartment and condo residents, the MUD [Multi-Unit Dwelling] issue is something that can be dealt with, but it doesn't always have to be for new construction or even retro fitting existing units. A solution in a public setting like this [park] works well."

Eric Cahill from Plug in America said that he was "excited to see this curbside Fast Charging, the first ever, in Sacramento. It's part of EVgo's



Specially prepared EVgo cookies were available to attendees!

nationwide network. Being right off the freeway makes it extremely convenient. It's the first I've seen, outside of Tesla's, where there is a whole bank of units which drivers can take advantage of. higher energy delivery volumes are possible, so if there's one taken, there should be others available. With the park for kids and other amenities in the area, it's very lucrative."

<https://www.plugshare.com/location/175194>

## International CANADA

### EV COUNCIL OF OTTAWA

Web Site: [www.evco.ca](http://www.evco.ca)  
Contact: Darryl McMahon  
[info@evco.ca](mailto:info@evco.ca)

### VANCOUVER EVA

Web Site: [www.veva.bc.ca](http://www.veva.bc.ca)  
Contact: Bruce Sharpe 604-897-9072

## MEXICO

### EVA of SONORA (AVES)

Web Site: [Diadelautoelectrico.org](http://Diadelautoelectrico.org)  
Contact: Oscar Vidal  
662-105-6551

## TAIWAN

### TEVA | Taiwan Electric Vehicles Association

FaceBook: [www.facebook.com/TaiwanElectricVehiclesAssociation](http://www.facebook.com/TaiwanElectricVehiclesAssociation)  
Contact: Mr. David Lane  
Phone: 011 866 987 526 892

## United States

### NEDRA National Electric Drag Racing Association

Web Site: [www.nedra.com](http://www.nedra.com)  
Contact: John Metric, 979-665-5621

### PLUG IN AMERICA

Web Site: [www.pluginamerica.org](http://www.pluginamerica.org)  
Contact: Joel Levin  
[info@pluginamerica.org](mailto:info@pluginamerica.org)

## ALASKA

### JUNEAU EVA

Contact: Duff Mitchell, 907-723-2481

## ARIZONA

### PHOENIX EAA

Web Site: [www.phoenixeaa.com](http://www.phoenixeaa.com)  
Contact: Jim Stack, 480-659-5513

### TUCSON TEVA

Web Site: [tucsonelectricvehicle.org](http://tucsonelectricvehicle.org)  
Contact: David Gebert 520-881-8010  
[tevadave@cox.net](mailto:tevadave@cox.net)

## CALIFORNIA

### CENTRAL COAST (CCEAA)

Web Site: [eaacc.org](http://eaacc.org)  
Contact: Will Beckett, 831-688-8669

### CHICO EAA

Web Site: [www.chicoeaa.info](http://www.chicoeaa.info)  
Contact: Jerry Brandstatt  
530-343-0331

### EVA OF SAN DIEGO (EVAOSD)

Web Site: [www.evaosd.org](http://www.evaosd.org)  
Contact: Elaine Borseth  
858-395-8181

### EVA OF SOUTHERN CALIFORNIA (EVAOSC)

Web Site: [www.evaosc.org](http://www.evaosc.org)  
Contact: Leo Galcher, 949-492-8115

### GOLDEN GATE EVA

Web Site: [www.ggeva.org](http://www.ggeva.org)  
Contact: Dale Miller, 415-472-0378

### MAMMOTH LAKES EASTERN SIERRA ELECTRIC VEHICLE ASSOCIATION (ESEVA)

Contact: Don Condon, President  
[EasternSierraEVA@gmail.com](mailto:EasternSierraEVA@gmail.com)  
Cell: 510-414-9948

### NORTH (SF) BAY EAA

Web Site: [www.nbeaa.org](http://www.nbeaa.org)  
Contact: Alan Soule, 707-477-1299

### SACRAMENTO EVA (SacEV)

Contact: Guy Hall, 916-717-9158

### SAN JOSE EAA

Web site: [rotordesign.com/sjeaa](http://rotordesign.com/sjeaa)  
Contact: George Stuckert  
408-377-5037

### SILICON VALLEY EAA

Web site: [www.eaasv.org](http://www.eaasv.org)  
Contact: Tom Sidle, 408-446-1538

## COLORADO

### DENVER ELECTRIC VEHICLE COUNCIL (DEVCC)

Web Site: [www.devcc.info](http://www.devcc.info)  
Contact: J David McNeil  
719-633-4924

## CONNECTICUT

### NEW ENGLAND EAA

Web Site: [www.neeaa.org](http://www.neeaa.org)  
Contact: David Oliveria  
860-526-1460

## DELAWARE

### COASTAL CAROLINA WILMINGTON

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

## FLORIDA

### CENTRAL FLORIDA EVA (CFEVA)

Website: [www.centralfloridaeva.org](http://www.centralfloridaeva.org)  
Contact: Larry Wexler 407-256-6244

### GOLD COAST EAA (GCEAA)

Contact: David Kerzel , 954-785-2184

### NORTHWEST FLORIDA EAA

Contact: Nathan Kercher  
850-472-0341

### SUN COAST EAA

Web Site: [www.suneva.org](http://www.suneva.org)  
Contact: Don Bouquet  
941-739-2868

## TALLAHASSEE AREA EVA

Web Site: [www.taeva.org](http://www.taeva.org)  
Contact: Gillian Smith  
954-829-1125

## GEORGIA

### EV CLUB OF THE SOUTH

Web Site: [www.evclubsouth.org](http://www.evclubsouth.org)  
Contact: Anne Blair 404-849-7929

## HAWAII

### BIG ISLAND EVA

Web Site: [BigIslandEV.org](http://BigIslandEV.org)  
Contact: Noel Morin 808-987-7428  
[nmorin99@yahoo.com](mailto:nmorin99@yahoo.com)

## IOWA

### IOWA EVA

Web Site: [www.evohinc.com](http://www.evohinc.com)  
Contact: Jeff Hove 515-250-2966

## IDAHO

### PANHANDLE EV ASSOCIATION PEVA

Website: [www.panhandleev.org](http://www.panhandleev.org)  
Contact: Gordy Ormesher  
208-660-8539

## ILLINOIS

### FOX VALLEY EAA

Web Site: [www.fveaa.org](http://www.fveaa.org)  
Contact: Michael Willuweit  
[contactfveaa@fveaa.org](mailto:contactfveaa@fveaa.org)

## INDIANA

### HOOSIER EVA

Web Site: [HoosierEVA.org](http://HoosierEVA.org)  
Contact: Richard Steiner,  
317-987-4890

## KANSAS

### MID AMERICA CHAPTER

Contact: Al Pugsley Jr, 913-381-1091

## KENTUCKY

### EvolveKY

Web Site: [www.evolveky.org](http://www.evolveky.org)  
Contact: Jon Tyson, 502-644-1719

## MASSACHUSETTS

### DRIVE ELECTRIC CARS NEW ENGLAND EAA

Web Site: [neeaa.org](http://neeaa.org)  
Contact: Mark Scribner  
860-336-7295

### PIONEER VALLEY EAA

Web Site: [pveaa.org](http://pveaa.org)  
Contact: Karen Jones

## MICHIGAN

### MICHIGAN EAA

Web Site: [michiganEAA.org](http://michiganEAA.org)  
Contact: Larry Tuttle, 734-995-9904  
[eea.mich@gmail.com](mailto:eea.mich@gmail.com)

## MINNESOTA

### MINNESOTA EAA

Web Site: [www.mneaa.com](http://www.mneaa.com)  
Contact: Tom Helin, 651-246-5730

## MISSISSIPPI

### MISSISSIPPI EAA (MSEAA)

Contact: Luke Lundemo  
601-981-6925

## MISSOURI

### GATEWAY EV (GEVA)

Web Site: [gatewayev.org](http://gatewayev.org)  
Contact: Wayne Garver, 314-359-9626

## NEVADA

### EAA NORTHERN NEVADA

Web Site: [www.lveva.org](http://www.lveva.org)  
Contact: Chuck Swackhammer  
530-479-0269

### LAS VEGAS EVA

Web Site: [www.lveva.org](http://www.lveva.org)  
Contact: Lloyd Reece, 702-524-3233

## NEW JERSEY

### EASTERN ELECTRIC VEHICLE CLUB

Contact: Oliver H. Perry  
609-268-0944

### NEW JERSEY EAA (NJEEA)

Web Site: [njeaa.org](http://njeaa.org)  
Contact: Michael Thwaite  
908-405-8688

## NEW MEXICO

### NEW MEXICO EVA (NNMEV)

Contact: Richard Dunn, 505-672-1095

## NEW YORK

### GREATER HUDSON VALLEY EAA

Contact: Seth Leitman, 914-703-0311

### GREATER NY EAA

Web Site: [lieaa.org](http://lieaa.org)  
Contact: Carl Vogel, 516-443-1715

## NORTH CAROLINA

### BLUE RIDGE EV CLUB

Contact: Joe Baum, 828-645-1412

### CHARLOTTE EAA

Contact: Jess Montgomery  
704-302-4156

### TRIAD EVA

Web Site: [www.tevaNC.org](http://www.tevaNC.org)  
Contact: Jack Martin, 336-213-5225

### TRIANGLE EAA

Web Site: [www.rtpnet.org/teaa](http://www.rtpnet.org/teaa)  
Contact: Deanne Mott, 919-783-8439

## OHIO

### CENTRAL OHIO EV ASSOCIATION (COEVA)

Contact: George Anderson  
614-487-9671

### EAA OF NORTHWEST OHIO

Contact: Michael Hall 419-691-1569

### GREATER DAYTON EV ASSOCIATION (GDEVA)

Web Site: [CleanFuelsOhio.org](http://CleanFuelsOhio.org)  
Contact: Tim Benford 937-604-3158  
[tbenford@me.com](mailto:tbenford@me.com)

## OREGON

### OREGON EVA

Web Site: [soheva.net](http://soheva.net)  
Contact: John Christian 503-524-0873

### OREGON SOHEVA

Web Site: [oeva.org](http://oeva.org)  
Contact: James Stephens  
541-552-9393

## PENNSYLVANIA

### THREE RIVERS EVA

Web Site: [www.threeriverseva.org](http://www.threeriverseva.org)  
Contact: Jonathan Belak  
724-387-8210

## TENNESSEE

### CHATTANOOGA EVA

Contact: Randy Whorton, 423-822-1840

### KNOXVILLE EVA

Web Site: [www.knoxev.org](http://www.knoxev.org)  
Contact: Gary Bulmer  
[gpbulmer@gmail.com](mailto:gpbulmer@gmail.com)

## TEXAS

### ALAMO CITY EAA

Web Site: [www.aceaa.org](http://www.aceaa.org)  
Contact: Craig Egan, 210-542-7707

### AUSTIN AAEAA

Web Site: [www.austinev.org](http://www.austinev.org)  
Contact: Aaron Choate, 512-453-2710

### HOUSTON EAA

Web Site: [www.heaa.org](http://www.heaa.org)  
Contact: Kevin Douglass, 713-927-6997  
[houstontxeaa@gmail.com](mailto:houstontxeaa@gmail.com)

### NORTH TEXAS EAA

Web Site: [www.nteeaa.org](http://www.nteeaa.org)  
Contact: Ron Swanson, 214-352-8180

## UTAH

### WASATCH EVA

Web Site: [www.wasatcheva.org](http://www.wasatcheva.org)  
Contact: Brian Flock, 760-271-8761  
[brian@flockgroup.com](mailto:brian@flockgroup.com)

*continued next page*



**VIRGINIA****DRIVE ELECTRIC RVA**

Contact: Charles Gerena, 804-560-3471

**RENEWABLE ENERGY & EVA, DIY PROJECT CLUB**Web Site: [www.reevadiy.org](http://www.reevadiy.org)

Contact: Mark Hanson, 540-473-1248

**WASHINGTON****MID-COLUMBIA EVA**

Contact: Garrett Brown, 509-713-0806

**NORTH SOUND EVA**Web Site: [www.northsoundeva.org](http://www.northsoundeva.org)Contact: Jason Thompson,  
360-920-0287**SAN JUAN ISLANDS EVA**

Contact: Bruce Nyden, 707-494-6693

**SEATTLE EVA (SEVA)**Web Site: [SeattleEVA.org](http://SeattleEVA.org)

Contact: Jay Donnaway

President@seattleeva.org

**TACOMA EVA (TACEVA)**

Contact: Stanley J. Lee, 253-383-4371

**WENATCHEE EVA (WEVA)**Web Site: [www.pluginncw.com](http://www.pluginncw.com)

Contact: Jack Anderson, 509-784-1747

**WASHINGTON D.C.****EVA OF WASHINGTON DC**Web Site: [evadc.org](http://evadc.org)

Contact: Ron Kaltenbaugh

240-586-0014

**WEST VIRGINIA****WEST VIRGINIA ELECTRIC AUTO ASSOCIATION (WVEA)**Web Site: [www.wveaa.org](http://www.wveaa.org)

Contact: Marty Weirick, 304 610-1617

**WISCONSIN****WISCONSIN EAA**

Contact: Benjamin J. Nelson

262-567-9348



## EV Legislation

continued from page 9

vehicle market which helps protect our air and environment while at the same time boosting American clean vehicle innovation and manufacturing jobs,” **said Luke Tonachel, Director, Clean Vehicles and Fuels Group, Natural Resources Defense Council.** “We are pleased to see bipartisan support for these related goals and hope this proposal will quickly pass.”

“As we build and grow the clean energy economy, we must continue to invest in tackling the sector that generates the most pollution: transportation,” **said Michael Brune, Executive Director of the Sierra Club.** “With this bipartisan legislation Senators Stabenow and Alexander recognize the opportunities we have by extending the electric vehicle tax credit and putting electric vehicles in the fast lane.”

“LCV applauds Senators Stabenow and Alexander and Congressman Kildee for their bipartisan legislation to extend electric vehicle tax credits,” **said Tiernan Sittenfeld, SVP of Government Affairs, League of Conservation Voters.** “At a time when our communities are feeling climate change’s impacts, electrifying the transportation sector could not be more important. Transitioning to a clean energy economy for all will create jobs and protect our health and communities—especially low income and communities of color who are hit first and worst by the impacts of climate change. While some in Congress are engaging in political stunts to stymie debate about solutions to climate change, LCV is committed to working with members of Congress, like Senators Stabenow and Alexander, Congressman Kildee, and the hundreds of state and local leaders working to solve this crisis.”

“The future is electric. Electric vehicles are much cleaner and cheaper to operate, and we need to help more people enjoy the benefits of this emerging technology,” **said Michelle Robinson, Director of the Clean Vehicles Program of the Union of Concerned Scientists.** “We

applaud this bipartisan effort to invest in a strong and growing electric vehicle market.”

“Electric vehicles are cleaner, cheaper to operate and maintain, and allow customers to fuel at home with domestic energy,” **said Jason Hartke, President, Alliance to Save Energy.** “Study after study has found that tax incentives are working to make them accessible to more Americans and encourage their sales. Without congressional action, the current incentives are essentially expiring, and that’s likely to stunt the growth of electrical vehicles in the U.S. and damage our leadership in a rapidly growing auto sector. Sens. Alexander and Stabenow have really stepped up to the plate here to ensure we don’t let the electric vehicle market stall and fall behind foreign competitors. This bill would go a long way to grow the electric vehicle market and make them affordable for more American families.”

“The nation must act urgently to protect the health of all Americans from air pollution and climate change. Reducing emissions from vehicles is a critical part of the solution,” **said Harold P. Wimmer, National President and CEO, American Lung Association.** “I applaud Senators Alexander and Stabenow for their leadership on this issue. More electric vehicles on the road, combined with clean, renewable electricity, will help reduce dangerous air pollution and fight climate change at the same time.”

“As a leader in electrification and high power electric vehicle charging systems, ABB supports the Driving America Forward Act, which keeps the U.S. on the forefront of automotive technology,” **said Jim Creevy, Vice President, Government Relations, ABB Inc.** “This bill ensures more vehicle choices at lower cost, enabling all Americans to choose the car that is the best fit for them, while continuing to drive innovation in one of America’s core industries.”



## WAVE 2019



### Join us at the e-Rally "wave"

From the **14th to the 22nd of June** around Switzerland or from the **13th to the 21st of September** through Germany  
PLUS spectacular landscapes, community, fun & friends. For more info and registration [www.wavetrophy.com](http://www.wavetrophy.com)



<https://www.facebook.com/wavetrophy>



### Introducing the HCS-60R and HCS-80R Ruggedized EV Charging Stations

Ultimate durability for the toughest conditions

LEVEL 2 | 240 Volt | 48 or 64 Amp | 25 Foot Cable

Impact and crush resistant overmolded connector

Field replaceable latch

5 year warranty



HCS-60R

Ruggedized HCS

**\$100**

option

In addition to \$899 base price

Total \$999 as shown



Learn more call 877-694-4194

RELIABLE  
POWERFUL  
MADE IN AMERICA