EV Dashboard Update – Jan 2020 Data

BEV Registrations Move Ahead; PHEV Growth Soft

In response to our standing Freedom of Information Act Request, the CT Department of Motor Vehicles has provided the EV Club with an updated file of EV registrations as of Jan 1, 2020.

The DMV publishes topline registration data on its website, but this is the only place where detail about these registration data is available publicly and for no charge.

The data from the DMV include make, model, model year, and fuel type. Keep in mind that each data point is a snapshot of registered vehicles at the time the file was generated. This isn't vehicle sales. It includes all EVs, whether acquired new or used, whether purchased or leased.

Battery Electric Vehicles (BEV) Responsible for Increases

There were striking differences this year by fuel type, something not seen in the past. BEV registrations rose 47%, while plug-in hybrids (PHEV) registrations increased only 8%. This is in stark contrast to the pattern one year ago when PHEVs had more momentum. (There are also small numbers of battery electric motorcycles (BEMC) and Fuel cell (FCEV) vehicles). BEVs now make up a majority of BEVs.

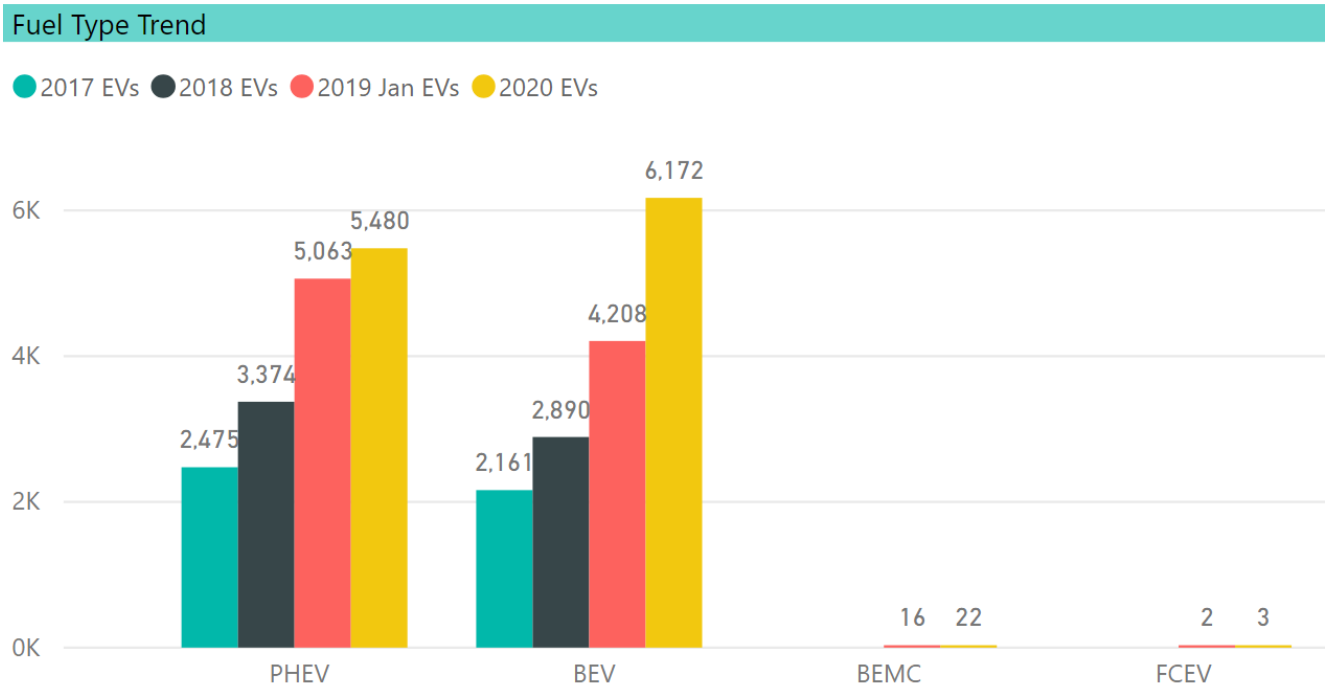


chart: Barry Kresch

This is the overall trend over the four years of data points we have. The relatively strong BEV number, when blended with the other fuel types resolves to a 26% increase, lower than one year ago. According to the DMV, there were 4120 new EV registrations, which means there was turnover in the fleet of 1732 vehicles.

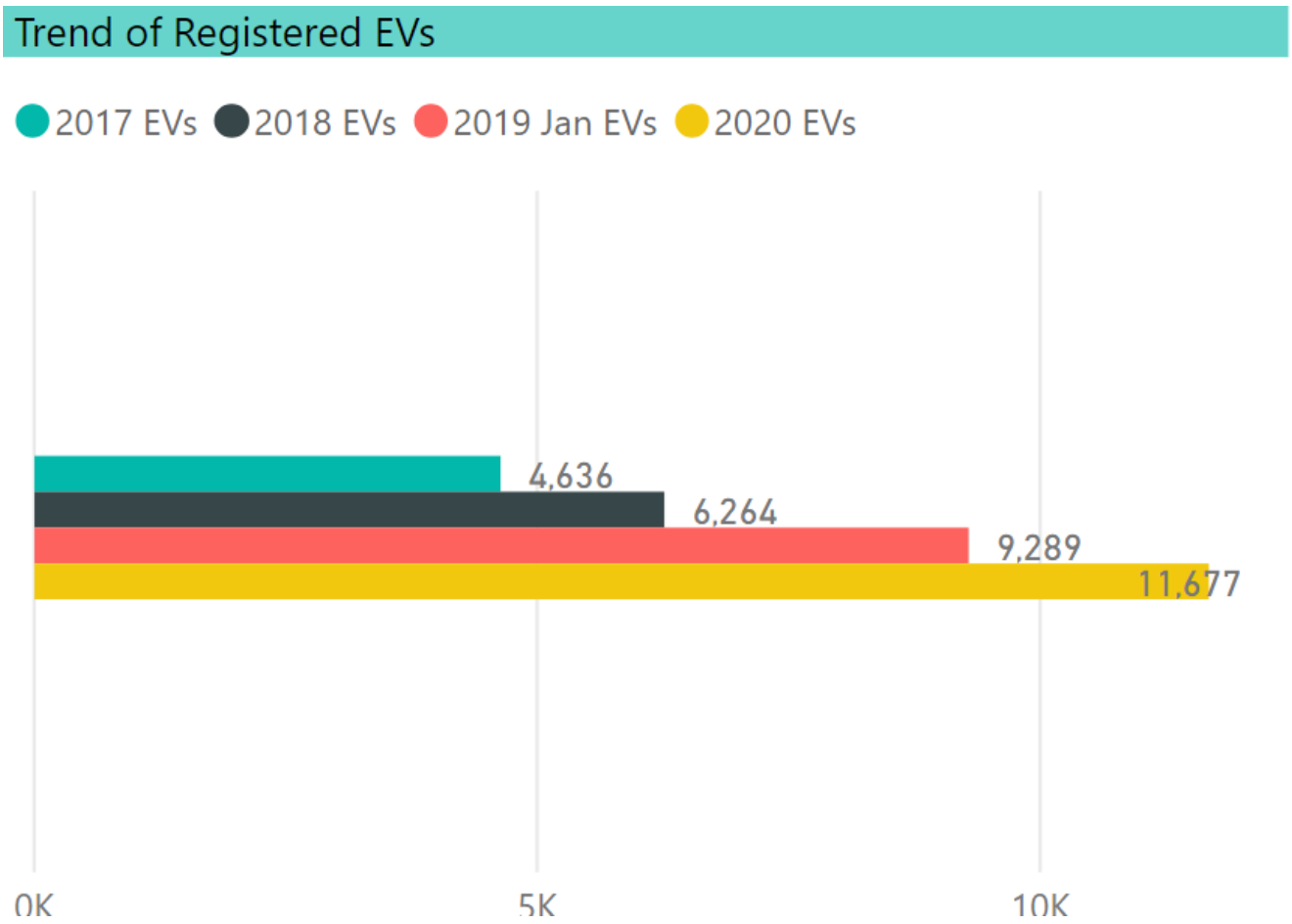


chart: Barry Kresch

The landscape for EVs was less forgiving in 2019. Nationally, 2019 saw a year over year decrease in new vehicle EV sales for the first time. Several states have imposed EV fees in the hundreds of dollars in the guise of a “road-use tax.” In CT, Tesla is still prohibited from opening stores, though they have recently obtained a leasing license for their one service center. The CT EV purchase incentive program, CHEAPR, saw cuts made to both the level of incentive and the MSRP cap that determines vehicle eligibility. These changes brought about a 71% decline in rebates. This correlated with weaker growth in the second half of the year relative to the first half (and ran counter to national sales trends). Also, Tesla and General Motors were in the phase-out period for the Federal tax credits. The tax credit for Tesla ended entirely as of December 31. As of March 31, 2020, it will end for GM.

Rate of increase slowed in the second half

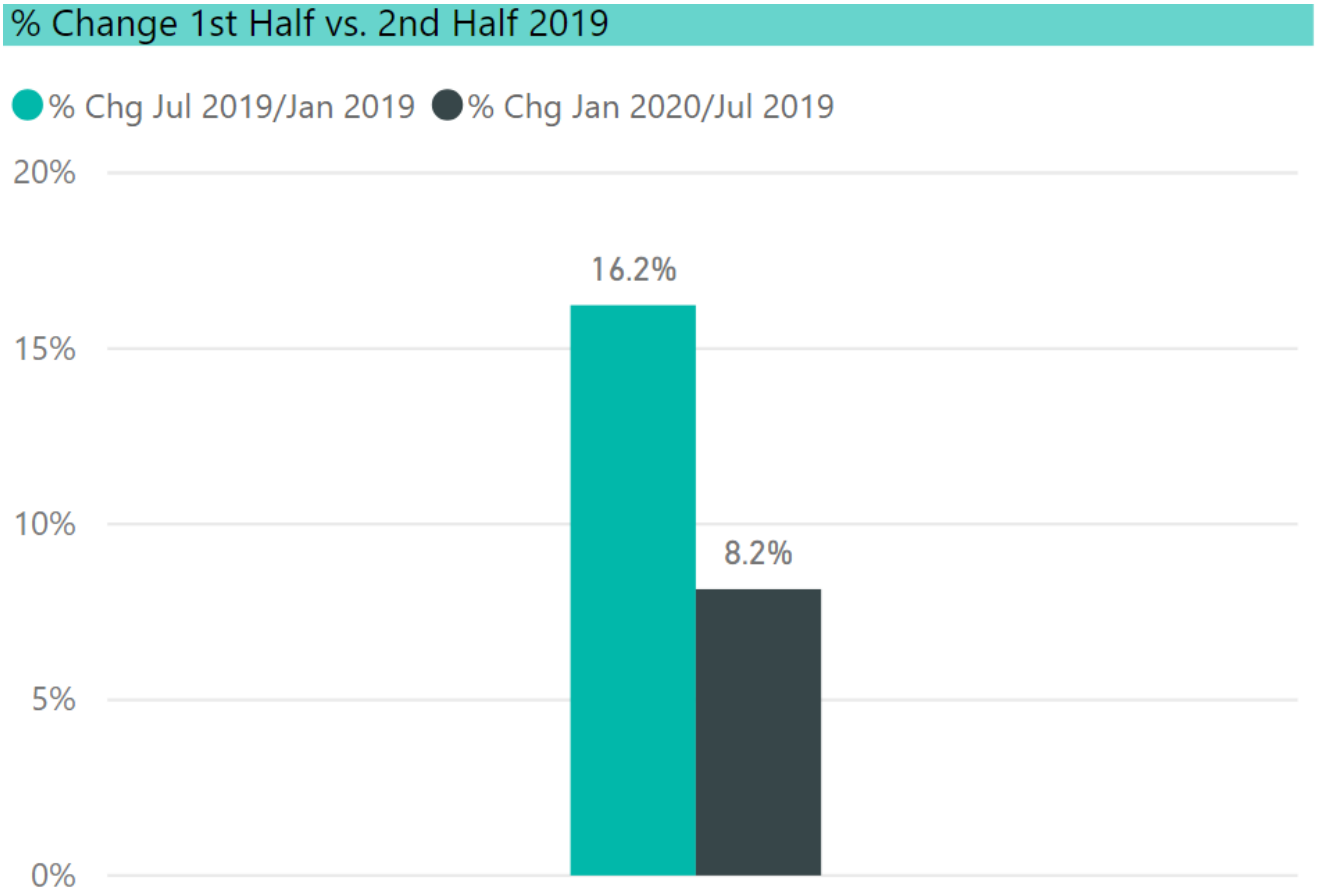


chart: Barry Kresch

Trend by Make

The only EV make to have a significant impact on the numbers was Tesla. The chart below shows the 4-year trend of registrations by make. It is truncated to make it more readable. As you can see, a small number of makes are responsible for the bulk of the registrations.

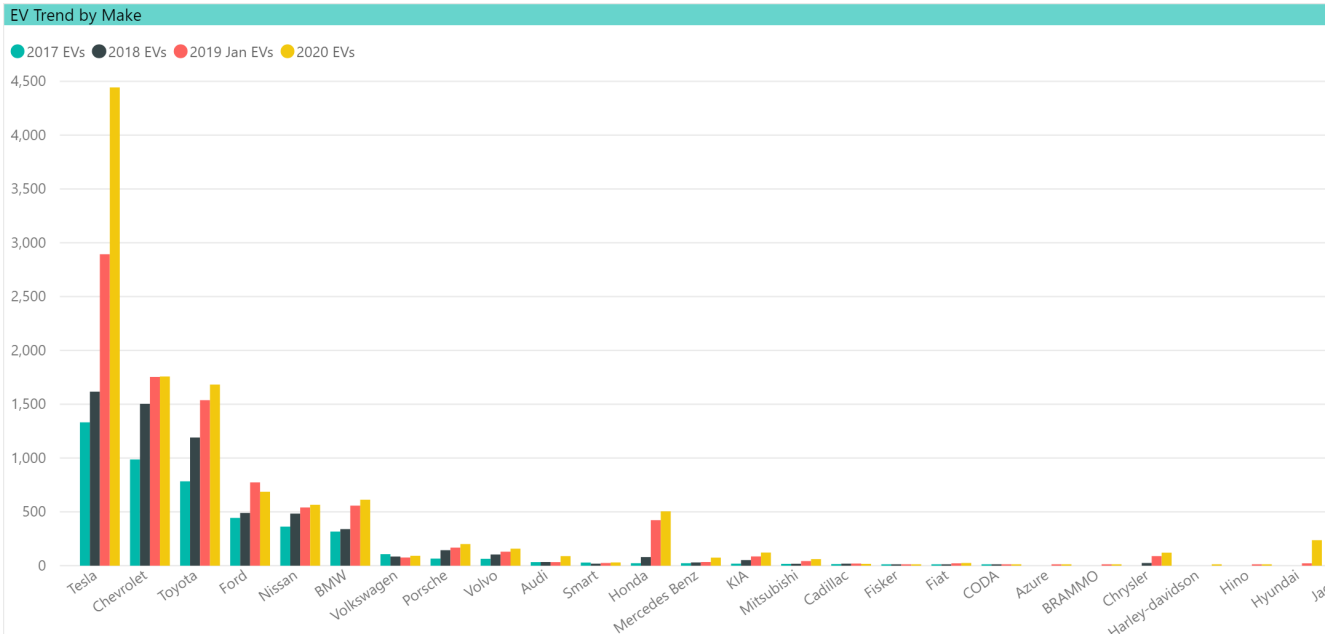


chart: Barry Kresch

This is a chart of the current registration profile.

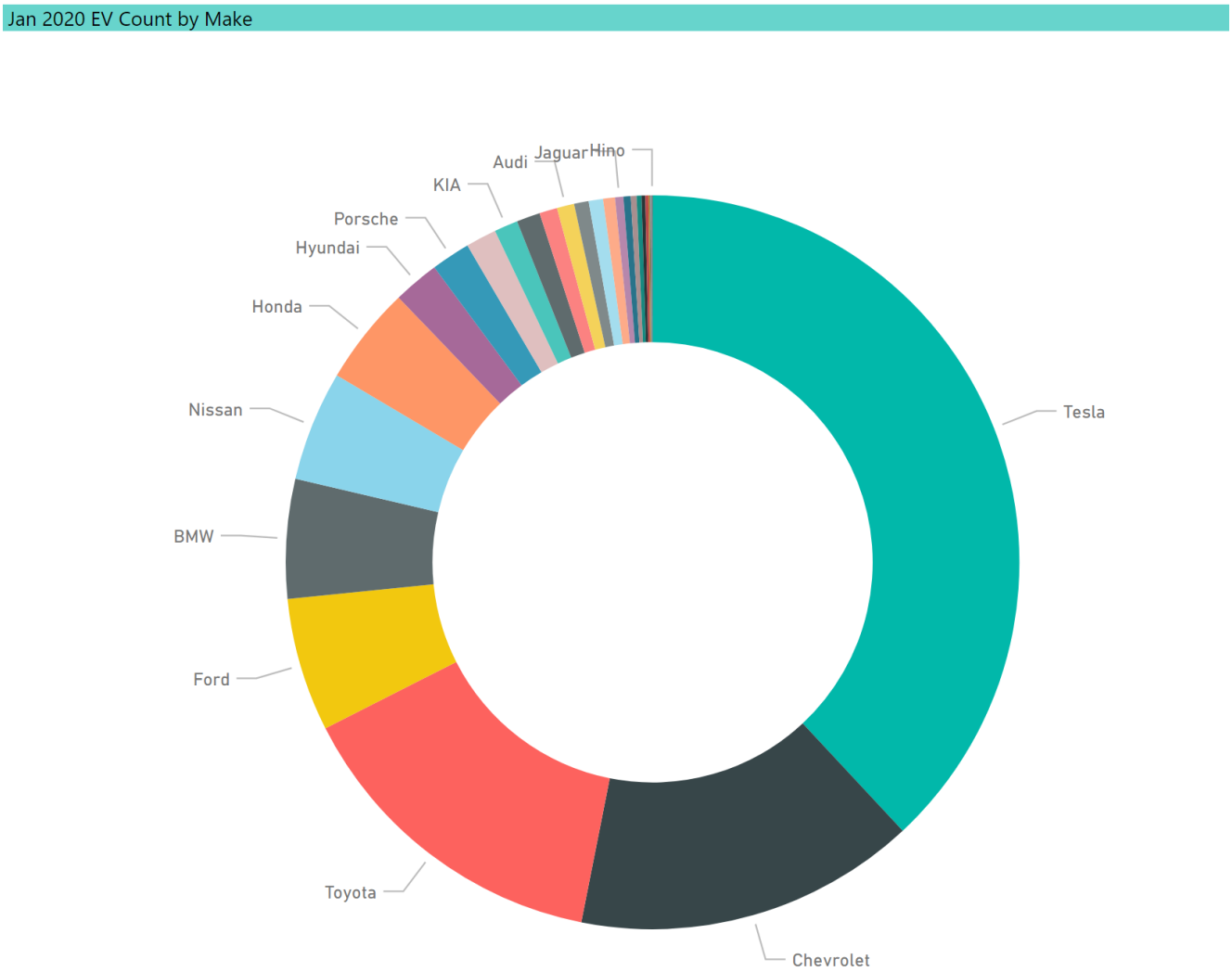


chart: Barry Kresch

This is a chart that depicts the contribution to the change for the last year by each make. Tesla accounts for 65% of the increase in registrations. This was followed by Hyundai with 9% and Toyota with 6%.

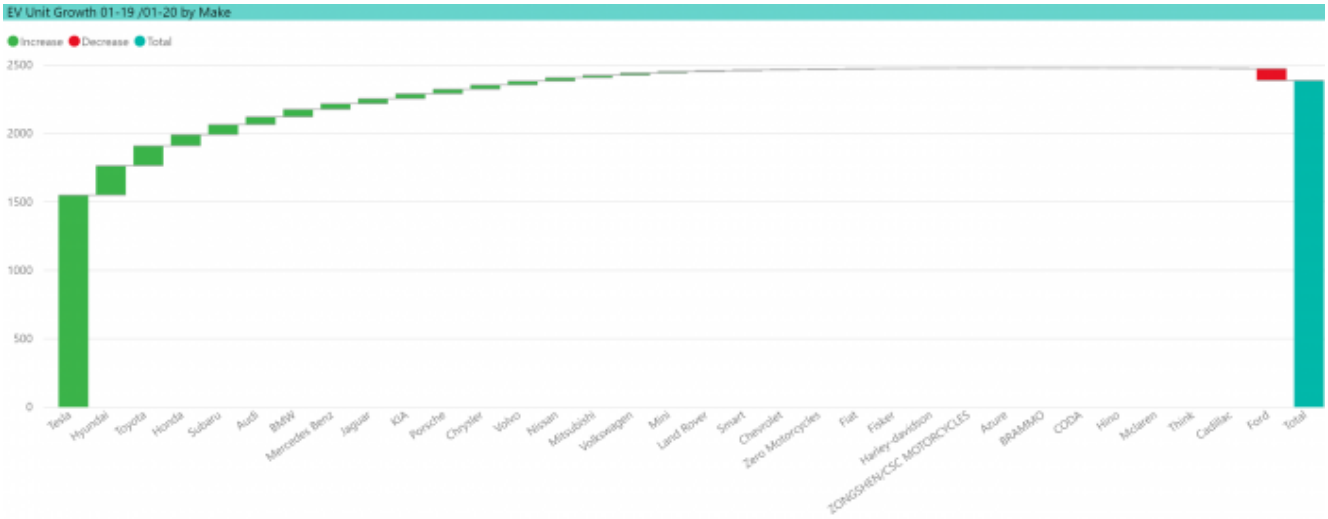


chart: Barry Kresch

Trend by Model

If there is a single story about 2019, it is the Tesla Model 3. It accounted for 84% of the Tesla increase. Even though it has only been in the market for about two years, it has become the most widely registered EV in the state, 38% higher than the Prius, which is the second-highest. For our purposes, we combined the Prius Prime with the older plug-in Prius.

Model 3 registrations increased 127% this year vs. last. The Model X had a 33% increase on a lower base. Among the other leading EVs, the Prius, Model S, Honda Clarity, Nissan Leaf, and Chevy Bolt all had more modest increases. The Honda Clarity had a big jump a year ago, but we have read reports that Honda has pulled it back from most states, and this is reflected

2019 was the year that General Motors discontinued the Volt, which at one time, had been the most widely registered vehicle. Volt registrations declined 1% as the car now begins

its gradual fade from view. This decline in the Volt, along with the softer performances of the Prius and Clarity, and no new PHEVs making much of a splash are what is behind the low PHEV increase.

The chart displayed below is an excerpt of the most widely registered models for display purposes.

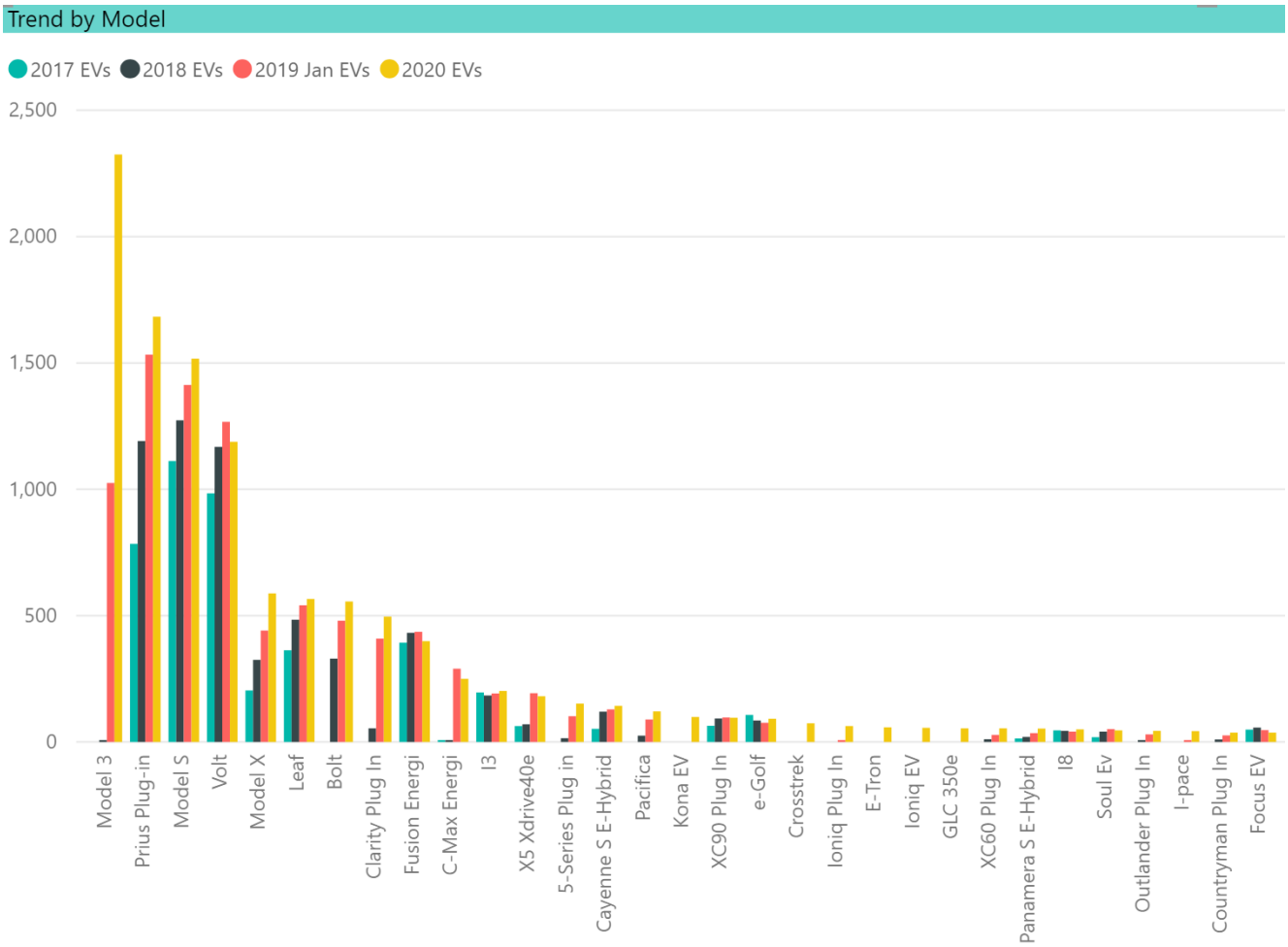


chart: Barry Kresch

WPD International

Model 3 Receives International Interest

The Westport Police Department has acquired a Tesla Model 3, which was announced by this blog on December 3rd, and via press release on December 10. It caused a bit of a stir locally, but it has also received international attention. The department has received calls from several European countries and Singapore asking about their process, experience, and seeking to follow up as more data are collected over time.

This level of interest may not have been a complete surprise. The PD brought the vehicle to the Connecticut Conference of Municipalities, held at Foxwoods on December 3rd and 4th. It is estimated that between 1500 – 2000 people came up to them, a combination of attendees from other municipalities as well as curious patrons, expressing interest and asking questions.

First M3 Squad Car

Westport is the second community to acquire a Model 3 for the police. Bargersville, Indiana was the first, and they posted a message on the WPD Facebook page congratulating them for doubling the number of towns using the vehicle for police work. The Westport M3, however, is being fully outfitted as a squad car, which was not the case in Bargersville.

WPD is working with Whelen Engineering and Fleet Auto Supply to develop and install the lights, siren, gun rack, and other accoutrements necessary for law enforcement duty. It’s all custom development. Nothing off the shelf fits the M3. These companies are providing their services for free to Westport because they see this as the beginning of a new market. That was not included in the cost-recovery calculations, but it

represents significant savings.

That funky material on the rear bumper? It is reflective, widely used in Europe, and a particularly useful safety precaution when a police cruiser is stopped for an emergency in an otherwise active lane of traffic.

Tesla Tech

All squad cars get outfitted with cameras and computers. But Teslas already come with some serious tech, and better quality than the police would normally buy as an add-on. Part of the learning process with this M3 is how much of that tech can be leveraged. As of this writing, Police Chief Foti Koskinas advises that they are going to be using the Tesla cameras, and the Tesla Fleet Department is working with them because, again, this will only become more widespread. The computer presents a more complicated challenge because there is confidential data from each party that would have to be protected. (We can’t have Tesla seeing INTERPOL alerts!) This is not resolved at this time.

With Tesla’s cooperation, the added features that require power will be wired directly into the Tesla battery. It slightly reduces range, but it is a much more elegant, cheaper, and safer solution than adding an additional 12-volt unit.

It is possible that when it becomes known how much of the Tesla tech can be leveraged that there will be acquisition cost-parity between this vehicle and the Ford Explorer that would have been the default option.

Police officers will be receiving training in the vehicle at Sikorsky Airport. It may be possible for some club-members to observe.

The Potential for State and Municipal Fleets to contribute to GHG Reduction is Enormous.

This vehicle is actually not the first plug-in owned by the department. It also owns a Toyota Prius Prime, a plug-in hybrid that gets about 25 miles of electric range (not used as a patrol car). The PD reports that most of the mileage on the car has been in electric mode, and the vehicle has worked out well.

On the other hand, there is New York City, which already has 2,200 plug-in vehicles in its fleet, avoiding 9,000 metric tons of CO2. All well and good, but Westport has one more police EV than NY. And the EV Club of CT applauds Foti and First Selectman Jim Marpe for taking this step.

There will be an open house in the spring for the public to see the new cruiser and speak to the police. The vehicle will also be brought to Maker Faire.

CHEAPR Falls Off a Cliff

Rebates Are Down 81% Based on Early Data

CHEAPR is the Connecticut EV purchase incentive program, administered by the Connecticut Department of Energy and

Environmental Protection (DEEP). As of October 15, DEEP lowered the incentive levels for all battery electric vehicles, plug-in hybrid vehicles (but not fuel-cell vehicles), as well as lowered the price cap that determines vehicle eligibility. We described these changes in detail here.

As reported in the YaleDailyNews.com, "DEEP representatives told the News that the incentive decreases were necessary to keep the program running." In other words, they are worried about running out of funds. In legislation passed earlier this year, CHEAPR was funded to the level of $3 million per year through 2025.

Our concern has been that the reductions are too large and that the lower price cap would exclude, in particular, the number one selling EV (by a mile), the Tesla Model 3. The early data seem to bear this out.

DEEP publishes data with a bit of a lag, and as of this writing on Dec. 8, there was a Dec. 2 update published with data through October 31. Also, there isn't individual day granularity; there are certain interval boundaries that we have to work with. Finally, we don't know if purchases made before the change, but where the vehicles were delivered afterward, are grandfathered in. All that said, the pattern that emerges is so clear it is like a punch in the nose.

We were able to isolate two 13-day periods, just before and just after the change, something of a "light switch" test. These periods are 9/24 – 10/6 and 10/19 – 10/31.

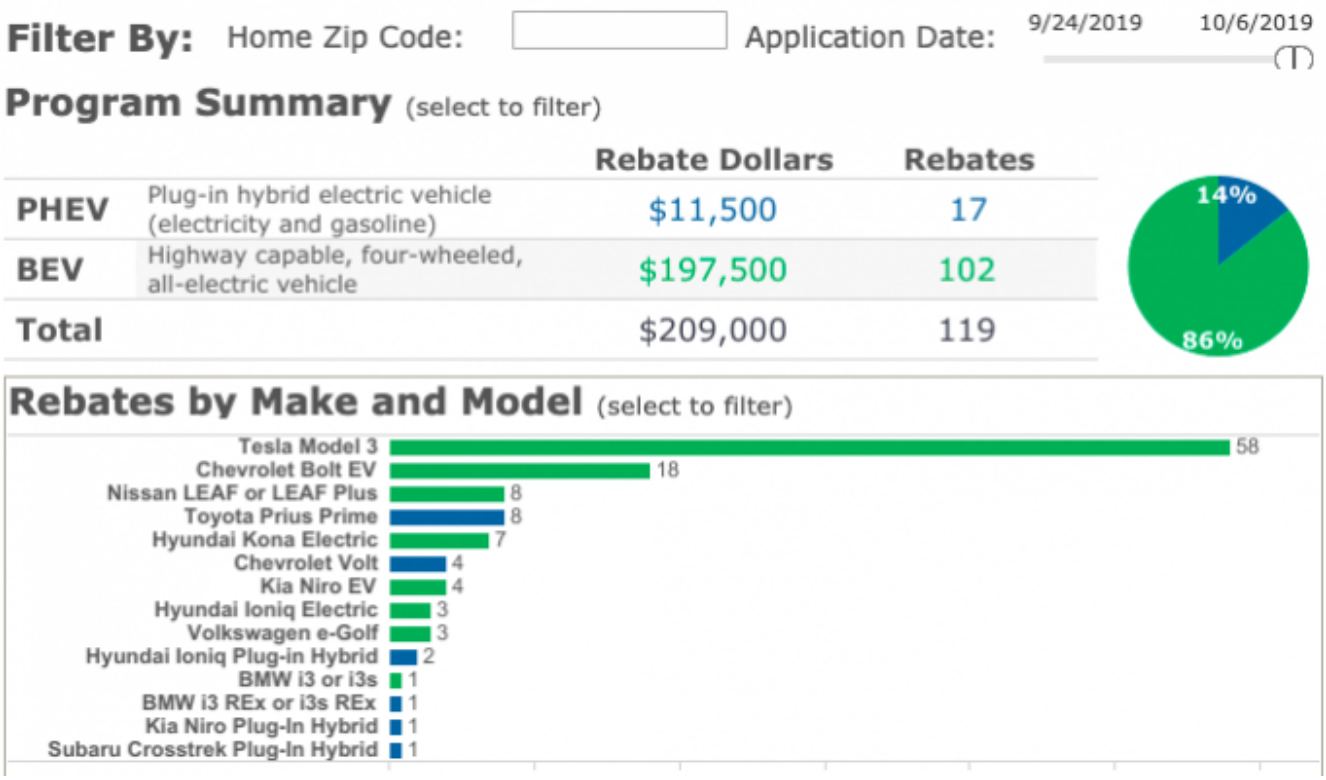
The number of vehicles for which rebates were issued declined by 81% (from 119 to 23). The dollar amount of the rebates is down 90%. The number of Model 3 rebates declined from 58 to 5. If a straight-line run rate is calculated from the post-change 13-day period, the program would disburse slightly over $600,000, well below the $3 million allotted cap.

Interestingly, if we look at the past 12 months of disbursements before the change (as close as we can get, 10/11/18 to 10/6/19), the amount disbursed was $2,867,500. Are they solving a problem that doesn't exist?

It is possible that their internal projections that led to the reductions are based on sales forecasts that aren't supported by current trends. In the legislation that authorized the funding, there is a provision to establish rebates for used vehicles, which has not been done to date. From our perspective, this is the tail wagging the dog. Let's make the program work. If it runs over budget, we would rather deal with a problem of success. If these changes hold, it will have undermined the intent of the legislation passed in the spring.

The data from DEEP

Dates are noted in the upper right corner.

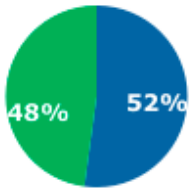


Data last updated: December 02, 2019 (most recent months partial)

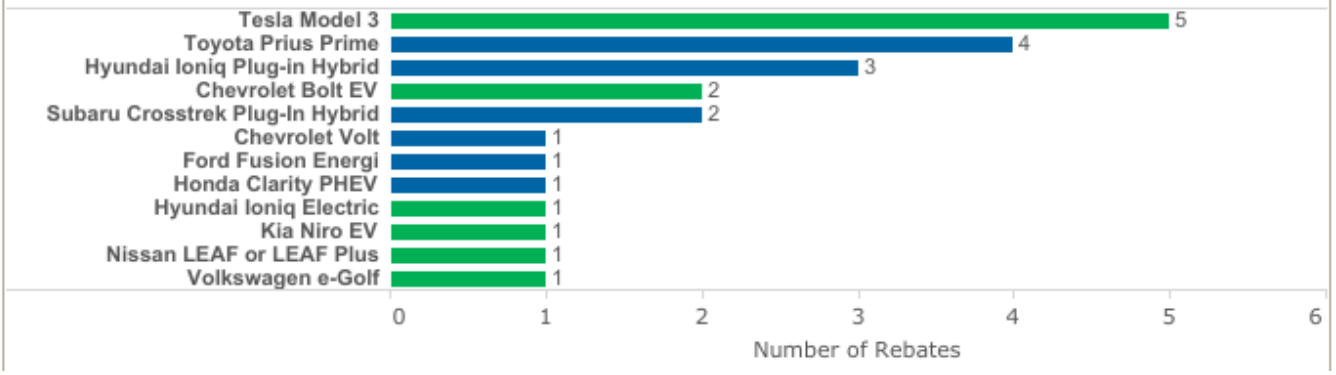
Filter By: Home Zip Code: Application Date: 10/19/2019 10/31/2019

Program Summary (select to filter)

		Rebate Dollars	Rebates
PHEV	Plug-in hybrid electric vehicle (electricity and gasoline)	$6,000	12
BEV	Highway capable, four-wheeled, all-electric vehicle	$15,500	11
Total		$21,500	23



Rebates by Make and Model (select to filter)



We expect to publish a subsequent update as more data become available.

EV Club CT 2019 Recap

2019 was a busy year!

Westport Police Department

The Westport Police Department is getting a Model 3 to be used as a patrol car. The club worked with Foti Koskinas, Chief of Police, providing information, allowing member vehicles to be used for test drives, and made introductions to Tesla in Mt. Kisco, NY (since there are still no Tesla stores permitted in CT). Westport PD is working with Whelen Engineering and Fleet Auto Supply to outfit the car with the features required for law enforcement. A more detailed description, updated as new information becomes available is here.

Legislation

The club has remained engaged with legislators, has offered testimony in Hartford, and is on the steering committee of the CT EV Coalition. It is through the coalition that many of the more complex initiatives are addressed, such as the DEEP EV Roadmap and the Transportation Climate Initiative. Coalition partners include the Connecticut Fund for the Environment, Sierra Club, Acadia Center, Plug-in America – 29 organizations altogether. This is the summary of comments prepared by the CT Fund for the Environment regarding the EV Roadmap.

EV Adoption Data

For our Interactive EV Dashboard, we are now in rhythm with our FOIA requests and the Department of Motor Vehicles to obtain semi-annual data dumps to continue our detailed tracking of EV adoption in the state. Next update expected in

the first quarter of 2020.

Showcases

Jaguar I-Pace
Photo: Barry Kresch

We receive numerous requests for EV showcases and have been doing a better job of vetting the opportunities to secure good visibility. This year included showcases at the Westport Maker Faire, STEAMFest at Housatonic Community College, Wilton Zero Waste Faire, Fairfield Green Wheels NDEW, among others. **Which leads us to a question.** There are more and more of these in more places around the state. With most of the membership in Fairfield County, it is hard for us to get to all of them. For those of you on this list from around the state who are interested in participating in these events, we can connect

people with events near them. Please reply to this mailbox if you have any interest! We will keep the names on file for when the time comes. Please make sure to let us know what town you live in and which EV you drive.

Climate Strike

Climate Strike Rallies – Club members participated in events in Hartford, New York, and Westport.

EV Shopper Study

The Sierra Club reached out to the club for help with the shoppers they needed for CT for its second EV Shopper Study, called REV Up Electric Vehicles. The depressing, though not surprising, highlight, was that 74% of dealers did not have an EV on the lot. A blog post about the study with a link to the full Sierra Club release can be found here.

Presentations

The club gives presentations about EVs, covering basic info, adoption, future outlook. The most recent was done at the Greenwich Environmental Lecture Series – Trends to Watch in the Energy Transformation of 2020.

Website

We have transitioned the website to reflect our current branding at EVClubCT.com. We recently added an events calendar. It is the basic version, which requires the admin to enter the info. If you know of an EV event that would be worth

posting, please send us the info via the website contact form. Send us the name of the event, location (including actual street address), date/time, event website (if there is one), event sponsor, graphic if you have one, brief description.

Last But Not Least

More people came to us this year than in the past looking for advice on buying an EV. Whether it was a dealer recommendation, questions about incentives or charging, or asking to be connected with the owners of a particular vehicle, we were able to help people navigate their way to driving electric.

CHEAPR Replenishment

CHEAPR Update

Connecticut Hydrogen and Electric Automobile Purchase Rebate, in case you were wondering, is what the acronym stands for. CHEAPR has been with us for a while now. It was passed in 2015 and has handed out 5267 rebates (through August 31), totaling over $10 million for the purchase of fuel-efficient EVs. (There were 10,797 EVs registered in the state as of July 1, so it sure seems like it has been a factor.)

If you go on the program’s website today (Oct. 1), it indicates that there is only $60,958 in remaining funds. But HB 7205, passed in the 2019 legislative session, authorizes a replenishment due to take effect today, which will hopefully be reflected soon, and which funds the program through 2025.

Keep in mind, CHEAPR is a rebate. It is not a tax-credit like the Federal incentive, and there are no manufacturer sales caps. The rebate is more consumer-friendly in our view.

Current Incentive Levels

CHEAPR standards have changed over time. The basic idea of the rebate size being driven by zero-emissions range is still present, but as cars have changed, so have the criteria. This is the current incentive breakdown:

Incentive Amount	EPA Rated Electric Range
$5,000	Any fuel cell electric vehicle
$2,000	BEV: 200 Miles or Greater
$1,500	BEV: 120-199 Miles
$1,000	PHEV: 45 Miles or Greater
$500	BEV: Less 120 Miles PHEV: Less than 45 Miles

As the chart indicates, incentives are available for plug-in hybrid vehicles (PHEV), battery electric vehicles (BEV), and fuel-cell electric vehicles (FCEV). The implication is that FCEVs have much greater range than a BEV. That isn't entirely the case. A Tesla Model 3 has up to a 310-mile range, Chevy Bolt gets 238 miles, Hyundai Kona is rated at 258. There are two FCEVs currently registered in the state. Both are Toyota Mirais, rated 312 miles. The other two FCEVs that we are aware of are the Hyundai Tucson (265 miles), and the FCEV version of the Honda Clarity (366 miles). There were no rebates given for either of the FCEVs. (It is also hard to find one within the price cap.) We're not entirely sure about the consistency here, but range is the stated principle.

The amount of incentive given for a lease may not be as straightforward as it gets folded into the mathematics of the lease payment calculation by the dealer. As the saying goes, your mileage may vary.

Many CT dealers are interconnected with the DMV/CHEAPR and will handle the paperwork. They often just take the incentive off the price of the vehicle they deliver. It saves the work of filing for the rebate, but we recommend carefully reviewing the invoice with the dealer in order to accurately set expectations regarding the price.

Price Cap

There are other requirements associated with CHEAPR. Eligible vehicles must have an MSRP below $50,000. (Originally, the cap was set at $60,000.) This makes ineligible a number of expensive EV entrants such as the Tesla Models S and X, Jaguar i-Pace, Audi e-Tron, and others. The Tesla Model 3 is eligible for the lower trim levels. It is possible to get the long-range (310-mile) Model 3 for under $50,000. We expect there to be trim levels of the forthcoming Model Y that will also be eligible, based upon what we see on the Tesla website. With respect to the FCEVs, the Honda Clarity base trim price is $59,365, Toyota Mirai is $59,430, Hyundai Tucson – $50,875 (FCEV base prices are from Car and Driver). Based on these MSRPs, it would appear they would all be too expensive to qualify, but they are listed as eligible on the CHEAPR website. We are only aware of the availability of these vehicles via lease. If you’re going that route, it seems prudent to verify the eligibility before concluding the transaction.

Once Only

Unlike the Federal tax credit, which is associated with each vehicle, the CHEAPR rebate is tied to the person receiving it. This rebate can be claimed *one time only*. It can be used for multiple vehicles if different (licensed) members of the household are the registrant. Pro-tip: Don’t co-sign for a vehicle because you will both get dinged for the use of the

rebate.

Where Can You Buy It

In order to be eligible, it is required that the vehicle be purchased from a dealer doing business in CT. (The dealer gets a little taste, too.) If you buy that Chevy Bolt from a dealer out of state and transfer the registration, you will not get the rebate. The exception to this is Tesla, which does not have dealers, and which has been barred by CT law from opening stores in the state. But the Model 3 trim levels that are below the price cap are eligible and Tesla will work with you on the admin.

New vs Used

This incentive applies to the purchase or lease of a new vehicle only. There is language in HB 7205 (line 142) authorizing DEEP to set income and incentive thresholds for purchases of used vehicles. We contacted DEEP for clarification and were advised that the rules as stated on their website are what govern eligibility, and these rules state, specifically, new vehicles only.

This is the link to the CHEAPR website. It lists all of the eligible vehicles as well as the rules and program stats.

Green Wheels Expo Draws Big Crowd

The Green Wheels Expo, one of many Drive Electric Week events being held around the country, had its strongest showing ever.

Over 70 EV owners exhibited their vehicles, along with 7 dealers and Tesla who held offered test drives. According to Scott Thompson, one of the Sustainable Fairfield leaders who organized the event said that attendance was higher in Fairfield than in similar events in San Francisco and Boston.

Along with many of the increasing numbers of EVs currently available, the event included an electric schoolbus.

This bus, from National Express Transit, currently in use in White Plains, NY, is a battery only zero emission bus. It has a range of 62 miles, more than enough for its daily run. One of the more unique things about it is that the purchase of the bus was subsidized by Con Edison with the proviso that it can be used as a 2-way battery when not in use ferrying students. In other words, it serves as stationary storage, which can then can be tapped in periods of very high demand. This is a potentially tranformative application and it is something that has been discussed in the EV world for some time. It will also get your warranty voided, as manufacturers err on the side of caution with respect to its impact on battery longevity.

There is always room for a few novelties that, you never know, may be the wave of the future. This is a Honda Insight conventional hybrid with solar panels, which extend its electric range of operation, courtesy of Eugene’s Green Garage

in Bridgeport.

There were several public officials on hand. In the photo below are Rep. Jonathan Steinberg and Sen. Tony Hwang.

National Drive Electric Week runs through September 22 with many events scheduled in the coming days. Find one near you with with [this link.]

Climate Action Week and National Drive Electric Week

Events

An Active Time of Year for EV and Environmental Events

National Drive Electric Week, Climate Action Week, and Greta Thunberg, the young climate activist from Sweden, all make this the time of year to move from the sidelines and participate! These are some of the events in CT. Many club members have already registered to exhibit their vehicles at National Drive Electric Week (NDEW) events and to attend Climate Action rallies.

Green Wheels Expo – September 14, 10 am – 2 pm

This is the NDEW event staged by Sustainable Fairfield. Location: 140 Mill Plain Road lot (across from Rec Center), Fairfield. Registrations are pacing ahead of last year. There should be numerous cars, plus 7 dealers and Tesla will be offering test drives. Also on hand will be an electric school bus, electric bikes, electric lawn equipment, EV food truck, and a solar-powered car! Register your vehicle.

Climate Action Day – September 20

There are events around the state and the nation. Club members will be going to Hartford, New York, Westport, and other locations. EV Club CT is one of 80 organizations sponsoring the event in Hartford.

Hartford – Start time 11:45 am. Location: 210 Capitol Avenue, Hartford, CT. For more details and resources, visit C3M

Facebook page and Event Webpage

Backgrounder on Greta Thunberg and Climate Crisis Mobilization

Westport Event on the Ruth Steinkraus Cohen Memorial Bridge at 11 am. The link to register

An important near-term priority is to oppose the natural gas plant currently undergoing permitting to be sited in Killingly. It isn't needed and, if built, will be operating long past the 2040 deadline for the grid to be carbon-free.

Electrify Your Drive NDEW Event in Old Saybrook – September 21, 11 am – 3 pm

There will be owners with their private EVs as well as dealer organized test drives. Also, antique EVs! And a Q&A session in the Pavillion. Location: 155 College Street, Old Saybrook. Register

Energy Fair and Green Expo in Southbury – September 21, 10 am – 2 pm

Location: 775 Main Street at the Gazebo Southbury Green. This is more a general green fair, but it has an EV showcase.

NDEW Madison – September 22, 1 – 4 pm.

Location: Madison Senior Center, 29 Bradley, Road, Madison. Register

Leo Cirino Steps Down as Club President

Leadership Transition

Club founder, Leo Cirino, has stepped down as club president. Leo was widely recognized for his tireless and effective advocacy for clean transportation and received multiple awards from area organizations. Leo will be the first club President Emeritus and was presented with a plaque during the club news conference of April 21. The new club president is Bruce Becker.

Bruce Becker presenting a plaque to Leo Cirino

Leo, who is a forward-thinker when it comes to clean transportation and vehicle electrification, founded the club in 2009, the first EV club in Connecticut. During his tenure, the club worked on numerous projects to showcase EVs, educate the public, and develop charging facilities. It could be why Westport has the highest EVs per capita of any town in the state.

EV Ownership Grows 35% in CT

35% Increase in 2017

The number of plug-in vehicles registered in CT has grown by 35.1% in a comparison of 2 data points one year apart.

The Westport Electric Car Club received an updated vehicle ownership file from the CT Department of Motor Vehicles which was obtained via a Freedom of Information Act request. This enables us to make comparisons with a similar file acquired 1 year ago. These files contain no personal data, just make, model, model year, and city.

This translates to 6264 vehicles this year compared to 4636 the prior year. The term EV includes both battery electric vehicles (BEV) and plug-in hybrid vehicles (PHEV). EVs represent .28% of all vehicles registered in the state this year, up from .20% last year. EV sales have been growing by double digit percentage increases for several years now, but when looking at a number like .28% of all vehicles, the context is that these recently manufactured EVs are in a file that contains all of the existing fleet in the state.

Keep in mind that these data points are static snapshots of vehicles registered. It is not the same as new car sales. It would include the purchase of used vehicles and it would not include vehicles that were sold or had a lease expiry. Broadly speaking, since they aren’t the same numbers, this 35% increase compares with a 26% increase in the sales of new EVs nationally in 2017 vs. 2016. As this post is being written the March 2018 EV sales figures are being released. Inside EVs is reporting a record month, with EV sales up 43% compared to March 2017.

Makes

The most widely represented EV make in CT remains Tesla with 1617 vehicles, followed by Chevrolet with 1504 and Toyota with 1191.

Cities

With respect to cities, Greenwich remains the city with the most EVs at 511. Westport is third with 266, though it has the highest per capita incidence of EVs at 1%, roughly 3.5 times the incidence of the state as a whole.

One of the most frequent questions we got when we did our analysis last year was how many fuel-cell vehicles were in the file. The answer this year is the same as last year: NONE!

There were several new models represented this year, including the Honda Clarity PHEV, Chrysler Pacifica PHEV, and the Mini-Cooper PHEV.

Increases

The makes with the largest percentage increases among those with a major EV presence (arbitrarily defined as at least 300 units) are Chevrolet at 52.4%, Toyota at 51.9%, Nissan at 33.3%, and Tesla at 21.4%. The Chevy increase was driven by the introduction of the BEV Bolt. Toyota introduced the Prius Prime, the new version of its plug-in Prius which is selling much better than the previous model. Nissan is transitioning to the new Leaf.

The elephant in the room is, of course, the Tesla Model 3.

Given that Tesla is the most widely represented EV brand in the state and given the fact that there is a backlog of unfilled reservations, if Tesla manages to wrangle its manufacturing bottleneck, it could change the complexion of the numbers. There were only 4 Model 3s included in this file. During recent testimony in Hartford, Tesla reported having over 3000 Model 3 reservations in the state. In Westport, Tesla represents 51% of all plug-ins and it accounts for 8.3% of all of the Teslas registered in the state. That projects out to something like 250-300 Model 3 reservations in Westport. In other words, if this is accurate, it represents a number roughly equal to all of the plug-ins currently registered in the town.

We won't know for a while about the Model 3, but we will be following up with additional information from our analysis of the data and an update to our interactive dashboard. Stay tuned!

The EV Outlook: Contradictory or Inexorable

The New Peak Oil

There was a documentary film called "Collapse," which premiered at the Toronto International Film Festival in 2009 about a self-styled investigative journalist named Michael Ruppert who claims to have predicted the 2008 financial crisis. In this film, he purports to forecast a looming

disaster caused by an insufficient supply of fossil fuels to support a growing world economy. “The mortal blow in human industrialized civilization will happen when oil prices spike and nobody can afford to buy that oil and everything will just shut down,” is how he characterized it.

Had that come to pass, it would certainly would have created some urgency to find alternatives. But that was then. Less than a decade later, we find ourselves awash in fracked oil and natural gas, and in the midst of a slow-burning (pun intended) climate crisis, where the political leadership at the Federal level in our own country, the largest country in terms of cumulative greenhouse gas emissions and the second largest in terms of current emissions, is more resistant to doing something about it than almost all other countries.

While Ruppert was wrong about “peak oil”, he made another comment that was more prescient with respect to the larger political dynamic: “It’s kind of sad because we as a species have become so disconnected from the Earth. We don’t have any real contact with the Earth. We don’t have any sense of its functions, its feeling, its seasons, its timings.”

If you would like more of a freak-out, albeit in a more soberly detailed, journalistic style, try reading The Sixth Extinction by Elizabeth Kolbert, who discusses (among other things) species adaptation in past cycles of climatic change and how this time is different. (It’s happening a lot faster, folks, too fast for evolution to keep up.)

Peak Oil and EVs

Where this fits with EVs, of course, is that transportation accounts for 40% of petroleum use globally. The meaning of the phrase “peak oil” has changed from meaning the scarcity of supply to the turning point in consumption level. The projected EV adoption rate is a big factor in determining when that occurs.

According to a survey of forecasts published by Bloomberg, the earliest this is likely to happen is shortly before 2030, as forecasted by Bank of America. The intersection point in terms of the cost curves of EVs and conventional vehicles is forecasted to be 2025. The point at which EV sales surpass ICE sales is forecasted to be 2038. Others, such as major petroleum exporters Saudi Arabia and Russia, forecast this peak oil point to be further out, more like 2050.

The Landscape

One may be forgiven for feeling a sense of cognitive dissonance when looking at the landscape for EVs in the USA.

- We have not reached the tipping point with consumers purchasing plug-in vehicles.
- There is a Federal tax credit, flaws and all.
- Tax credit notwithstanding, the political environment at the Federal level is largely unfavorable to clean energy. Auto manufacturers have had success in persuading the current administration to back away from phase two of the Obama CAFÉ requirements.
- There is a mixed landscape across the states with some offering incentives and others that add a surcharge to EV registrations.
- Many dealers are reluctant to sell EVs. (This is a link to a 2015 NY Times articleabout this subject. This is a link to a more recent, candid, and thoughtful article by an employee at a Chevy dealership about the challenges of selling EVs, even when working for a dealer who is supportive.)
- EVs remain under-marketed.
- A recently reported study conducted by KPMGof 1000 auto industry executives reported negative sentiment for near/medium term EV prospects. To quote from Green Car Reports, “76% of executives see internal combustion engine vehicles as still more important than electric

drivetrains for a very long time." They felt the biggest hurdle is a lack of charging station infrastructure. (Strangely, they were more bullish on fuel-cell vehicles to break out, even though there is even less hydrogen infrastructure.)

And yet there have been numerous ambitious announcements by major legacy auto manufacturers.

- GM has announced the development of a modular EV platform that will be the basis for 20 or more vehicles. This flexible platform is intended to lower the cost substantially. They anticipate selling1MM EVs per year (globally) by 2026 (and "bury Tesla").
- Ford announced an $11 billion investment in 40 plug-in vehicles by 2022.
- Volvo intends to phase out gasoline engines by 2024.
- Fiat/Chrysler announced the future of automobiles is electric. This by CEO Sergio Marchionne, the same person who several years ago asked customers not to by his Fiat 500e BEV.
- Volkswagen, in the wake of "dieselgate," has announced a pivot to EVs and, as part of the settlement for the diesel emissions fraud, a $2 billion investment in charging infrastructure.

At least part of the reason for these plans is what is happening outside of the USA.

- The EV poster child is Norway, where 52% of new car sales are now EVs, and their goal is to phase out diesel and gasoline by 2025. They are using a panoply of carrots and sticks, including generous subsidies, to drive this result which they hope can be phased out over the next 10 years. And the price of gasoline is 15.86 krone per liter (Jan 2018), or about $7.65 per gallon (compared to $2.53 in the USA, per AAA).
- Paris plans to ban diesel by 2025 and phase out gasoline

vehicles by 2030. Britain and France plan to ban the sale of gasoline and diesel vehicles country-wide by 2040.
- China has ordered the discontinuation of 553 vehicle models that are the most polluting.
- Japan now has more charging stations than gasoline stations.

Plug-in vehicle models are becoming more numerous. Electric propulsion is beginning to be incorporated into larger vehicles. The energy density in batteries is steadily improving. Prices are coming down to the point where, eventually, incentives won't matter. The EVs on the market now have mostly been well-received, are fun to drive, and will only get better and more diverse.

While there are different forecasts about when EV sales will overtake those of internal combustion vehicles and when peak oil consumption will occur, nobody thinks it won't happen. The Georgetown Climate Center held a webinar on February 13 regarding planning for charging infrastructure for an EV corridor in the Northeast. Just to excerpt one sentence with respect to combating carbon emissions, "Without electrification of the transportation sector, there is no clear path to meeting our goals."