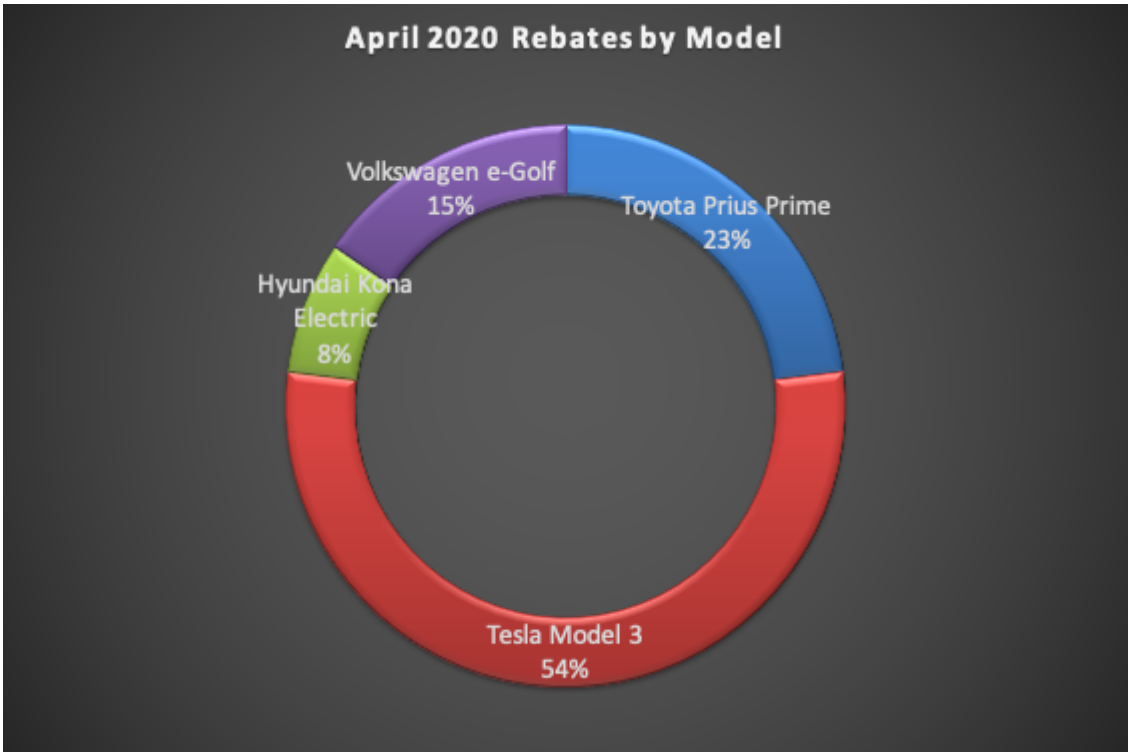
What if They Gave a Rebate and Nobody Came

Rebates at Lowest Level Ever

The lowest number of monthly rebates since its inception has been awarded by CHEAPR in April 2020, a not so grand total of 13, down from 90 in March.

There is almost no public reporting anymore of monthly new vehicle sales, but we know the automotive sector rapidly plunged in the latter half of March, which was felt over the duration of April. There have been some reports of a modest uptick in May.

Following the counter-intuitive increase in rebates in March (relative to Jan. and Feb.), when the rest of the world was collapsing, this is probably more in line with what will be the new normal for the time being. Tesla so dominates the EV market, as well as being the only manufacturer to post a sizable YOY sales increase in Q1, that how many Model 3s are rebate eligible is mostly what determines where the trend

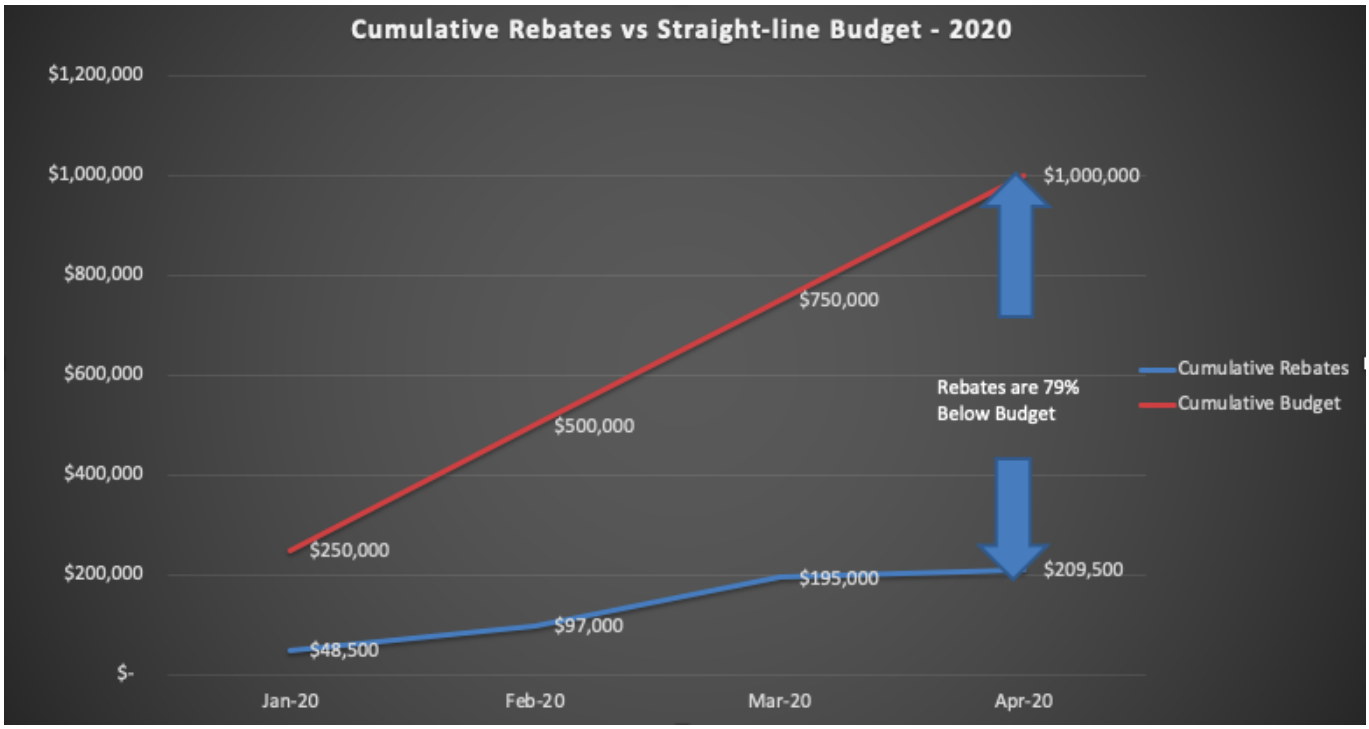


goes. It is also possible that some Model 3 supply disruption due to the temporary closure of the Fremont plant is part of the reason, as well. The Model 3 accounted for 54% of April rebates, which translates to all of 7. General Motors has been heavily discounting the Chevy Bolt, but there were no Bolt rebates in April.

CHEAPR Way Under Budget

This blog has been critical of the drastic restrictions imposed on rebate parameters in October 2019. DEEP told us at the Tesla Leasing Event in February that they were concerned that funds would run dry. That was a 3-month problem (Oct – Dec. 2019) until the new funding started, but the new CHEAPR board has yet to course-correct, despite pacing hugely under budget.

The CHEAPR budget is $3 million annually and there are no rules about how it is supposed to pace. There are good reasons for carefully managing the budget. Temporary funding disruptions are, well, disruptive. However, if we look at the budget on a straight-line cumulative basis and compare it to the dollar amount issued for rebates, by that definition it is pacing 79% below budget.



There is also the consideration of a forthcoming rebate for used EVs. To this point, there has been no announcement, and we are doubtful there will be one anytime soon because the Roadmap recommends that an outside contractor be engaged to design and implement it, meaning this presumably hasn't happened yet. We also expect that an incentive for a used EV will be lower than for a new vehicle, and will include an income cap, as well as a lower MSRP cap. We don't see this as a budget-buster.

EV Roadmap and CHEAPR

The subject of purchase incentives is accorded 15 pages in the EV Roadmap and it traces the origins and thinking about the program. It is still true today, as it was in 2015 when CHEAPR was begun, that while battery prices are on a downward trajectory, EVs have not yet reached cost-parity with ICE vehicles. Cited in the Roadmap is a stat from the Multi-State ZEV Action Plan that there was an average purchase price difference of greater than $10,000 between comparable EV and ICE vehicles in 2016. While EVs cost less to run and maintain, this headline price difference is a real barrier.

I have to say that it was a surprise to learn from the Roadmap that until 2020, CHEAPR was a pilot. For 5 years. Well, okay. With the legislation that was passed last year, it is now reconstituted with an independent board that remains situated in DEEP for administrative purposes.

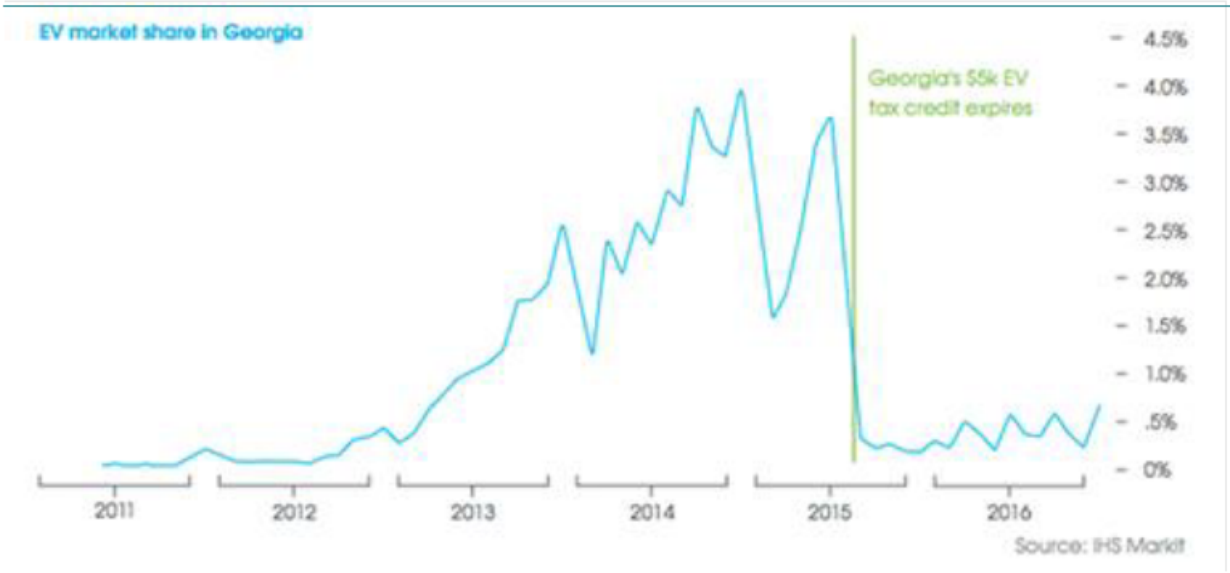
Something that *has* changed is that two manufacturers, Tesla and General Motors, have exceeded the unit sales threshold for the federal EV tax credit and have passed beyond the phase-out period. There is no federal incentive for vehicles from these two manufacturers. The Roadmap cites projections from EVAdoption that indicate the next automaker to cross the sales threshold will be Nissan in the latter half of 2021. (This projection predates the COVID-19 crisis.) Attempts in Congress to modify the program and raise the threshold have not met with success. In this context, CHEAPR assumes a larger role.

Value of Purchase Incentives

The EV Club of CT is a supporter of CHEAPR and available data indicate that incentives matter. CHEAPR has handed out 5,984 rebates through April 30, 2020. Given that there were 11,677 EVs registered in the state as of Jan 1, 2020, the program looks to have played a meaningful role. Survey-research of rebate recipients reports that over 80% of respondents cite the incentive as being either extremely or very important to their decision to acquire an EV.

The Roadmap cites experiences of similar programs in other states. One of them is Georgia, which has been cited previously in this blog, as a dramatic example of a “light switch test.” When Georgia lawmakers rescinded a generous tax credit of $5,000 and added an annual EV fee, sales fell off a cliff. This is a graphical representation of what happened that was published on page 89 of the Roadmap.

Figure 19: Effect of the Georgia state EV tax credit repeal on Georgia's EV adoption rates



Rebate Parameters

There are several variables that go into how much of a rebate if any, a given EV purchaser qualifies for, which we are calling rebate parameters (and which DEEP refers to as "bins).

- Available funding
- Rebate size and tiers
- MSRP cap
- Future consideration of a rebate for used EVs, along with a likely income cap.
- One rebate lifetime per licensed driver

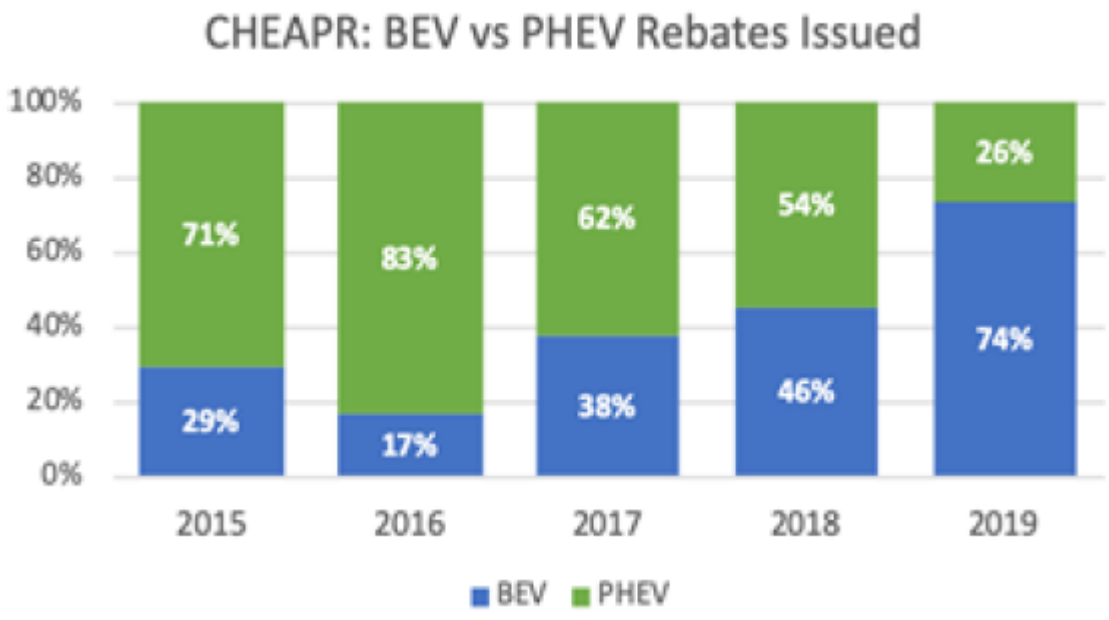
Rebates are offered for battery electric vehicles (BEV), Plug-in Hybrid Electric Vehicles (PHEV), and Fuel-Cell Electric Vehicles (FCEV). Rebate parameters have changed several times since the program began. The size of the rebate was originally pegged to the size of the battery pack but was modified in 2017 to be based on EPA-rated electric range. Battery pack size is not directly indicative of the range, so this approach makes sense. Also, over time, there are changes in technology (substantially longer ranges) and other aspects of the environment that gradually, but consistently, evolve.

The MSRP cap initially was $60,000. It was changed to $50,000 in October of 2018 and then to $42,000 where it currently stands. Rebate tiers are currently $5000 for any FCEV, $1500 for a BEV with a range of at least 200 miles, $500 for a BEV with a range of fewer than 200 miles, and $500 for any PHEV.

The number of rebates awarded has declined significantly since the October change and it is obviously because the lower level now excludes almost all trim levels of the Model 3. This blog has discussed this previously on April 2nd and in earlier posts.

We also noted that the lowering of the MSRP caused a shift in the mix of rebates toward PHEVs, which we discussed here. (April is the low-volume exception.) But you wouldn't know this from the Roadmap, which on page 83, contains this exhibit of rebates by fuel-type.

Figure 15: Rebate percentages by vehicle type over time



The footnote indicates that the rebate data had been updated through July 26, 2019, in other words, before the changes were made. It seems clear that lowering the MSRP cap was counter-productive, both from the perspective of consumers being able to use the rebate along with making the funds less efficient

in terms of zero-emission miles subsidized. The market in general is trending toward BEVs which may eventually change things. But we strongly feel that the MSRP should be raised to at least $50,000 (same as MA) or higher (NJ is $55,000 and NY is $60,000). The rebate levels could be left in place while the run-rate is evaluated with the higher MSRP, whatever modeling has been done for used EVs, and projections for when this depressed market normalizes. We are not aware of the law allowing unused funds from one year to be carried forward.

Dealer Incentive

A headline that appeared over a NY Times story in 2015 read, “A Car Dealers Won’t Sell: It’s Electric.” The unwillingness of many dealers to sell EVs has been a persistent bottleneck. So the idea that DEEP included in the original CHEAPR formulation a $300 incentive that would go to the dealership for each EV sold seemed a worthwhile experiment. It may sound slightly farcical to pay a business that is in the business of selling cars to sell cars, but if that is what it takes to seed change, so be it.

The incentive was subsequently lowered from $300 to $150. In the Roadmap, DEEP openly questions whether it is worth it and whether the funds would be better allocated to consumers to stretch what is a modest budget when compared to incentives in other states. (For example, the New Jersey per capita funding is 50% higher.) DEEP also found that the majority of the incentives were kept by the dealership, i.e. not given to the salespeople, which was kind of the basic idea.

This was underscored by two EV Shopper Studies done by the Sierra Club in 2016 and 2019. In the latter study, it was found that 74% of dealers did not have a single EV on the lot. The study did not report out CT separately (only CA had sufficient sample size for that) but in the 2019 study, there were no local dealers among those visited in the research that scored the highest rating. Our EV Club does know of some

dealerships that do a good job with EVs and we appreciate them. We just wish they were the norm and not the exception.

VW Works Around Its Dealers in Germany

The most interesting recent development is from VW in Germany. They have announced that VW corporate will take responsibility for selling EVs and the dealers will only act as agents. Dealers will arrange test drives and deliver the car, but will not otherwise be part of the sales process. They will receive a fee for each vehicle they deliver and they will not have to buy the car. This last part is particularly interesting because it eliminates the risk of having to carry the cost of financing the vehicle if it is a slow-seller. It is the closest one can come to direct sales while still maintaining the franchise sales model and implicitly acknowledges its limitations. Here is a more detailed description published in ChargedEVs.

Dealer Recognition Program

Instead of the dealership financial incentive, we endorse DEEP's proposal to work with the CT Auto Retailers Association (CARA) and create a dealer recognition program. If this is promoted to the consumer, it could serve to avoid some of the negative feedback loop that currently exists. We encourage that care is taken in giving this award so it isn't vaporware. EV Club of CT works with the Sierra Club to conduct its EV Shopper Studies and our feedback to them will be to separately track visits to dealerships that are recognized in this way to see if their actions match the certification.

Fuel-Cell Electric Vehicle Incentive

CHEAPR has included FCEVs in its incentive plan from the beginning when incentives were set at $3,000. In July of 2016, the FCEV incentive was raised to $5,000. And when the MSRP cap was lowered to $42,000 for EVs, it was raised to $60,000 for

FCEVs (they're more expensive).

There have been exactly zero of these incentives awarded and there is a total of 3 FCEVs registered in the state. There is only 1 public hydrogen refueling station in CT.

FCEVs were dropped from the federal tax credit in 2017.

The rationale in the Roadmap is to support all promising new technologies and DEEP recommends continuing these levels for FCEVs for the duration of the current funding, which is through 2025. Their goals are modest: 591 FCEVs in the fleet and 6 or 7 refueling stations in the state by 2025. Keep in mind that a hydrogen refueling infrastructure has to be built from scratch. The other rationale that we have heard is that FCEVs have a longer range (and a short refueling time if you can find a place to fill up). The range part of that used to be the case, but now the longer-range BEVs have a similar range as FCEVs and higher mpg-e. Certainly, the differential in incentive can no longer be justified by range alone.

This blog is not against FCEVs, which are zero-emission vehicles. We do feel that DEEP/CHEAPR over-emphasizes them and, at times, uses them to represent CHEAPR in an intellectually dishonest way. At the Tesla Leasing Event in February, the DEEP spokesperson said that the CHEAPR program offers rebates of up to $5,000. It may be a convenient headline, but it is only true in the narrowest technical sense. For all practical purposes, the max rebate is currently $1500. And almost no Tesla qualifies for even that.

This is a link to the Roadmap. DEEP recommendations for CHEAPR are on page 92. We won't repeat them here.

As we have made clear, these are our priorities:

- Raise the MSRP cap.
- Move quickly to implement an incentive for used EVs.
- Raise rebate levels, funds permitting.

- Eliminate the dealer incentive and re-purpose those funds for consumers.
- Develop guidelines for a dealer recognition program, which hopefully includes some input from consumers.
- Publish rebate data at the dealership level as they do in New York. Arguably, that alone is a dealer recognition program.
- Make e-bikes eligible for incentives under CHEAPR.

And, finally, one area where we are in agreement with the Roadmap, is to look to the future and the potential for leveraging incentives by partnering with utilities, as part of TCI, and with the manufacturers.

EV Roadmap – "Cliff's Notes" Version

The EV Roadmap prepared by the CT Department of Energy and Environmental Protection is a dense, 104-page document. We recommend reading it if you have the time. But for those who want to cut to the chase, below is the cut/pasted recommendations from each section. Following the recommendations is the glossary from the report, which is nothing if not laden with jargon.

Policy Recommendations

Public and Private Fleets

1. DAS should develop a detailed light-duty fleet transition plan that outlines annual EV procurement targets for the state fleet, beginning with a 5 percent

target of eligible state vehicles in 2020, in order to meet ZEV procurement requirements in accordance with Public Act 19-117.
2. Public and private fleet managers should utilize vehicle telematics systems, as DAS is currently piloting, to establish fleet benchmark data on the day-to-day operations of both EVs and comparable ICE vehicles, in order to inform future vehicle purchasing and infrastructure deployment decisions.
3. Public and private fleet managers should align the useful life cycle of EVs with manufacturer battery/mileage warranties and consider total cost of vehicle ownership when making procurement decisions.
4. DEEP will look to partner with other interested state agencies to create a web-based resource center dedicated to fleet electrification with helpful resources for public and private fleet managers, including case studies, best practices, and vehicle benchmarking tools.

Medium and Heavy-Duty Electrification

1. DEEP will continue to evaluate the benefits of adopting California's ACT regulations. A CARB staff report summarizing the initial statement of reasons for adopting the rule was proposed in October 2019.
2. DEEP will continue to monitor the effectiveness of freight truck voucher incentive programs in accelerating the adoption of freight trucks.
3. DEEP will continue to engage in outreach with Connecticut municipalities through the Municipal Collaborative on Fleet Electrification regarding electric school bus and other medium and heavy-duty fleet deployment opportunities available through the VW Grant.

Residential Charging

1. A residential Level 2 EVSE incentive program tied to participation in TOU rates or a managed charging pilot program should be implemented in the near-term so that it can be scaled up to meet market growth while minimizing grid impacts.
2. DEEP will explore pilot programs for EVSE deployment at MUDs.
3. Connecticut should enact right-to-charge legislation that prohibits condominium associations and landlords from restricting condominium owners or lessees with designated parking spaces from installing EV charging equipment and associated metering equipment.

Workplace Charging

1. DEEP encourages employers considering workplace charging solutions to distribute a survey to gauge employee interest and determine charging infrastructure needs.
2. DEEP recommends that employers considering workplace charging solutions contact their EDC as early as possible in the planning process to assist with site evaluation, equipment selection, cost estimates, and possibly even financial incentives for EVSE.
3. DEEP encourages employers to equip at least 10 percent of their total parking spaces with Level 1 charging plugs and evaluate opportunities for installing networked Level 2 EVSE with co-located DERs to meet the refueling needs of employees.
4. Connecticut should support legislation that more broadly enables EVSE at commercial properties to qualify for C-PACE funding.

Fleet Charging

1. DEEP suggests that fleet operators and managers work

with their EDC to identify solutions that will minimize distribution system impacts and help realize greater cost savings, including managed charging specific to fleet use case, deployment of DERs, and optimizing infrastructure buildout for their use case.

Consistency of Consumer Experience

Interoperability

1. All publicly-accessible Level 2 and DCFC station sites, installed or operated with the use of public funding, should be required to have both CHAdeMO and CCS connections available on site.

Future-Proofing

2. The make-ready portion of electrical infrastructure installed at publicly-funded, publicly-accessible locations should be capable of supporting chargers with a minimum 150 kW capacity.
3. Charging station developers should be encouraged to evaluate the potential to pair charging stations with on-site DERs when assessing and selecting a charging station location.
4. The potential future need for additional charging stations should be considered when installing make-ready electrical infrastructure and selecting the placement of charging stations at specific locations.

Minimizing Grid Impacts and Maximizing Benefits through demand-reduction measures

Active and Passive Managed Charging

1. DEEP will explore the potential for an active managed charging program that incents EV drivers to charge during off-peak periods.
2. The EDCs' current TOU rate tariffs should be optimized, and EV-specific TOU rates and dynamic pricing should be evaluated as additional options, to shift charging behavior to off-peak periods.
3. DEEP will continue to monitor the effectiveness of innovative programs in other jurisdictions, unrelated to rate design, to incent off-peak charging.

Fleet Charging

4. DEEP will explore options to examine distributed and grid-side technologies and services that could help to more cost-effectively integrate charging for the Hamden Bus Pilot and other fleet electrification initiatives through its Public Act 15-5 proceeding.
5. The potential should be explored for establishing a commercial EV fleet rate that incents off-peak charging and minimizes adverse impacts to the electric grid.

Demand Charges

1. DEEP recommends exploration of a sliding scale tariff approach for both Eversource and UI that is responsive to DCFC station utilization and EV market penetration.
2. DEEP recommends exploration of the costs and benefits of a commercial EV fleet rate that incents off-peak charging and minimizes adverse impacts while maximizing benefits to the electric distribution system and its customers.

Building Codes and Permitting Requirements

1. DEEP recommends that the State Building Code standards be updated to: (1) require that all new MUDs and commercial construction be pre-wired to accommodate Level 2 EV charging equipment; (2) require that 10 percent of parking spaces be pre-wired to accommodate Level 2 EV charging equipment and outfitted with a 120-volt power outlet for Level 1 EV charging; and (3) establish ADA compliance requirements for EV charging stations.
2. DEEP recommends that the state adopt a voluntary municipal stretch building code and that municipalities adopt zoning ordinances with more stringent EV pre-wiring requirements.
3. DEEP recommends that the Codes and Standards Committee and the Office of the State Building Inspector adopt best practices for DCFC permitting and deployment Consolidate and streamline the permitting and inspection process for Level 2 EVSE and DCFC installations.
4. DEEP will update and publish guidelines for the installation of EVSE at state-owned facilities and public and private EV charging stations.

Innovation

1. DEEP recommends that the EDCs and charging station developers partner on a pilot program to identify existing locations with excess load capacity that can support the deployment of publicly accessible curbside EV charging.
2. DEEP will explore the potential for V2G/V2B pilots.
3. DEEP will monitor potential opportunities for developing a transactive energy marketplace that rewards optimal EV charging behaviors and expands the public charging network.

Purchase Incentives

1. Continue to collect and analyze CHEAPR purchase survey data to implement changes that improve overall program effectiveness.
2. Move expeditiously to implement the revised CHEAPR program per Public Act 19-117, including:

o Establish rebate parameters, including rebate levels, bins, LMI components, MSRP, eligibility criteria, and strategy to communicate program adjustments.

o Consider implementation options with and without auto dealer incentive.

o Maintain and expand education, marketing and outreach.

o Develop strategies to manage exhaustion of funding each year.

o Retain a program administrator familiar with used electric vehicle rebates.

o Establish metrics necessary to maintain program health and funding.

3. Support expansion and extension of the Federal EV Tax Credit.
4. Work to develop market-based incentives to support EV adoption through TCI, the EDCs, and the OEMs.
5. Maintain FCEV rebates at current levels through the next five years of the program along with the development of infrastructure to incent the deployment of FCEVs.

Education, Marketing, Outreach

1. Connecticut should continue to leverage opportunities to

support and participate in the regional DCDE campaign and the Destination Electric Program to build upon and increase consumer awareness in the state and the region.
2. DEEP will work with OEMs to explore additional marketing opportunities for the EVs available for sale in Connecticut and the region.
3. As part of PURA's ZEV Docket, utility investment in marketing and education should be considered to support full utilization of any utility investment in EV charging infrastructure.
4. The EDCs should provide data associated with charging use to help municipalities and private industries deploy infrastructure in priority areas.

Volkswagen EVSE

These recommendations are framed based on the ongoing and significant investments by Electrify America and the potential for PURA to develop a regulatory framework that could impact EVSE deployment, and may require adjustment as the regulatory process advances. Connecticut's VW Mitigation Trust EVSE funds ($8.4 million) could be allocated in the following ways to support widespread electrification, including:

1. Direct funding of state and municipal EVSE to support light duty government EV deployment targets specified in Public Act 19-117;
2. Grants for Level 2 workplace charging; next to home charging, which will account for 60-80 percent of all charging, the second most prevalent charging location will be at the workplace and will reassure early EV adopters;
3. Grants for publicly-accessible Level 2 charging to provide reasonably cost-effective and highly visible charging infrastructure that supports use patterns of current EV drivers, while also strengthening the

perception that the state's charging network is sufficiently robust to eliminate range concerns;
4. Grants for MUDs, which could also include innovative solutions for MUDs such as charging hubs, community-based EV sharing, valet, or mobile charging. As part of a make-ready program, the utilities are well-positioned to also offer energy efficiency measures to MUDs that could reduce the cost associated with electric system upgrades necessary to support EVSE;
5. Grants for hydrogen fueling infrastructure and regional corridor development; and

Reserving a residual amount of funding to address gaps in the EV fast-charging network not filled through a utility program, Electrify America build-out, or other EVSE provider efforts.

Abbreviations:

AC – alternating current

ACT – Advanced Clean Trucks Regulations

ADA – Americans with Disabilities Act

AFLEET – Alternative Fuel Life-Cycle Environmental and

Economic Transportation

ATV – alternative technology vehicle

BAU – business as usual

BESH – Basic Electric Service Hourly

BEV – battery electric vehicle

BNEF – Bloomberg New Energy Finance

CAA – Clean Air Act

CAFE – Corporate Average Fuel Economy

CALGreen – California Green Building Standards Code CARA – Connecticut Automotive Retailers Association CARB – California Air Resources Board

CHEAPR – Connecticut Hydrogen and Electric Automobile

Purchase Rebate

CO2 – carbon dioxide

C-PACE – Commercial Property Assessed Clean Energy CSE – Center for Sustainable Energy

CT – Connecticut

CVRP – California Clean Vehicle Rebate Project

DAS – Connecticut Department of Administrative

Services

DCDE – Drive Change. Drive Electric.

DCFC – direct current fast charger/charging

DEEP – Connecticut Department of Energy and

Environmental Protection

DER – distributed energy resource

DMV – Connecticut Department of Motor Vehicles

DOE – U.S. Department of Energy

DOT – Connecticut Department of Transportation

EDC – electric distribution company

EPA – U.S. Environmental Protection Agency

EV – electric vehicle

EVSE – electric vehicle supply equipment

FCEV – fuel cell electric vehicle

FHWA – Federal Highway Administration

FTA – Federal Transit Administration

GBTA – Greater Bridgeport Transit Authority

GC3 – Governor’s Council on Climate Change

GHG – greenhouse gas

GIS – geographic information system

GMP – Green Mountain Power

GPS – global positioning system

GREET – Greenhouse gases, Regulation Emissions, and Energy use in Transportation

GWSA – Global Warming Solutions Act

HOV – high occupancy vehicle

ICC – International Code Council

ICE – internal combustion engine

IECC – International Energy Conservation Code

kWh – kilowatt hour

LED – light-emitting diode

LMI – low- and moderate-income

Low-No – Low- or No-Emission Grant program

MOR-EV – Massachusetts Offers Rebates for EVs MSRP – manufacturer suggested retail price

MUD – multi-unit dwelling

MY – model year

NAAQS – National Ambient Air Quality Standards NDEW – National Drive Electric Week

NESCAUM – Northeast States for Coordinated Air Use

Management

NHEC – New Hampshire Electric Co-op

NHTSA – National Highway Traffic Safety Administration NOx – nitrogen oxides

NREL – National Renewable Energy Laboratory NYSERDA – New York State Energy Research and

Development Authority

O&M – operation and maintenance

OCPI – Open Charge Point Interface

OCPP – Open Charge Point Protocol

OEM – original equipment manufacturer

OpenADR – Open Automated Demand Response

OSCP – Open Smart Charge Protocol

PG&E – Pacific Gas and Electric Company

PHEV – plug-in hybrid electric vehicle

PM-2.5 – particulate matter 2.5

PUC – public utility commission

PURA – Public Utilities Regulatory Authority

RMI – Rocky Mountain Institute

SDG&E – San Diego Gas and Electric Company

SIR – Savings-to-investment ratio

SO2 – sulfur dioxide

SUV – sport utility vehicle

TOD – transit-oriented development

TCI – Transportation and Climate Initiative

TOU – time-of-use

UC Davis – University of California Davis

V2B – vehicle-to-building

V2G – vehicle-to-grid

VIN – vehicle identification number

VOC – volatile organic compound

VMT – vehicle miles traveled

VW – Volkswagen

ZEV – zero emission vehicle

ZEV MOU – Zero-Emission Vehicle Memorandum of Undertanding

DEEP EV Roadmap Takes The Scenic Route

EVs = Clean Air

“If I could wave my magic wand and we all had electric cars tomorrow, I think this is what the air would look like,” said Ronald Cohen, a professor of atmospheric chemistry at UC Berkeley who has been studying the effects of the stay-at-home orders on air quality, as reported recently in the LA Times.

The Electric Vehicle Roadmap prepared by the Connecticut Department of Energy and Environmental Protection (DEEP) has been recently released. For all the research and policy thought that went into it, and there is quite a lot, the report reads with a striking lack of urgency and overlooks opportunities to start making immediate progress.

It is tragic that it took a pandemic and its collateral economic damage for us to breathe clean air. CT air quality is often poor as detailed in the Roadmap (p. 12). Worse, preliminary findings from a study conducted at Harvard Medical School indicate that breathing polluted air increases COVID lethality.

As bad as what we are currently enduring may be, it presents an opportunity for us to make changes. If we make the right choices, we can always have clean air, respond to the climate crisis, and create new green jobs. But this requires action. The recommendations in the Roadmap are mostly of a tentative or preliminary nature. These are a few examples.

Demand Charges

If we are to have enough public charging to mitigate range anxiety, we need more public DCFC (fast chargers), particularly along the Interstates. It isn't happening because utility demand charges, which weren't developed with EVs in mind, make commercial installations economically unviable. Note the "out of order" level 3 chargers on I-95 and the Merritt Parkway (our information is that out or order = turned off).

Photo: Matthew Kresch

Demand charges are extra fees imposed if electricity usage exceeds a certain threshold. The purpose is to pay for the infrastructure needed to support peak usage periods and it affects commercial customers. The fees can be substantial.

Pacific Gas and electric in California presented a rate design solution to the regulatory board in 2018 that would use a subscription formula to avert demand charges. The California Energy Commission released an extensive study of how to think about demand charges in an EV world in April 2019.

In contrast, this is the recommendation in the Roadmap: "DEEP recommends exploration of a sliding scale tariff approach for

both Eversource and UI that is responsive to DCFC station utilization and EV market penetration."

There is currently a temporary three-year demand charge waiver in place in CT. We're one year into it. Few seem to be aware of it. Regardless, a temporary waiver isn't going to accomplish anything due to the risk of stranded assets. The CT Public Utilities Regulatory Agency has recently issued an RFP for Program Design Proposals with a deadline of July 31. In other words, we're just getting started.

Time of Use

Time of Use pricing (TOU) is an important consideration both for making EV "refueling" cost-efficient as well as for grid optimization. If you have ever visited this Eversource page, you will see how little CT consumers have to work with. Or if you have tried the energy savings calculator on cutmybill.com, the limitation of only using normative data makes it of little use.

Utilities in Vermont, California, New York, and Massachusetts have implemented residential incentive programs that may include paying for a networked level 2 EV charger or moving the charging to a lower rate for off-peak times. It not only saves the customer money; it saves the utility money as well due to avoidance of adding capacity. Con-Edison in New York has an incentive that works with a device that accesses the vehicle's telemetry and awards rebates for charging that occurs during off-peak times (even outside of Con-Ed territory).

That said, this is a complex and utility-specific topic. It involves considerations of whole-house or EV only. The latter requires either sub-metering or a networked level 2 charger. The recommendations in the Roadmap on page 68 are, "…explore the potential for an active managed charging program that incents EV drivers to charge during off-peak periods."

"…current TOU rate tariffs should be optimized…" "DEEP will continue to monitor…programs in other jurisdictions…" DEEP alone can't implement TOU. The utilities must do it. The regulators need to approve it. We would have preferred to have seen more specific recommendations.

State Fleet

CT maintains a fleet of about 3,500 vehicles. The Roadmap recommends, "DAS (Department of Administrative Services) should develop a detailed light-duty fleet transition plan that outlines annual EV procurement targets for the state fleet, beginning with a 5 percent target of eligible state vehicles in 2020…" We assume "eligible" means mainly sedans, since that is the bulk of currently available EVs.

By way of contrast, New York City has replaced a third of its fleet of sedans with EVs as of 2019 and is targeting having 4,000 on the road by 2025. They report a savings of $550 per year per vehicle in fuel and maintenance for an EV sedan relative to its internal combustion engine (ICE) counterpart. And, by the way, they installed 568 charging stations and counting to support this fleet, 65 of which are solar-powered. Finally, the city plans to cut its fleet by 1,000 vehicles as part of an effort to reduce on-road miles traveled. Based on the experience of NY and others, including some municipalities in the state, CT can move much more quickly with low risk.

Heavy-Duty Vehicle Vouchers

As noted in the Roadmap, California and New York have implemented voucher incentive programs to offset the acquisition cost of clean heavy-duty vehicles. CA has used this program to fund the deployment of over 4,000 such vehicles. The Roadmap: "DEEP will continue to monitor the effectiveness of freight truck voucher incentive programs in accelerating the adoption of freight trucks."

Transit Buses

The Roadmap addresses buses: “on and after January 1, 2030, at least thirty percent of all buses purchased by the state shall be zero-emission buses.” If “at least thirty percent” equals 40% for the sake of argument, that means that the fleet would be 33% electrified by 2040.

New York City plans for its entire transit bus fleet to be zero-emission by 2040.

Purchase Incentives

CT has an EV purchase incentive called CHEAPR. Funding was renewed by the legislature last year at $3 million annually for 5 years beginning with 2020. The incentive plan in New Jersey funds $10 million per year, which translates to 50% higher per capita. And CHEAPR is pacing 75% under budget for this year due to restrictive parameters imposed in October 2019. The MSRP cap should be raised and the rebate levels re-evaluated.

The enabling legislation for the new CHEAPR funding also authorizes an incentive for used EVs with an income cap. Good idea, as there are more than twice as many used vehicles sold each year relative to new vehicles, and it would make EVs more accessible to car-dependent lower-income households. The Roadmap recommends contracting with a program administrator. It is fine to go outside for needed expertise. We just don’t understand why it wasn’t done a year ago when the legislation was passed.

Direct Sales – MIA

A glaring omission is direct sales. This refers to what has been known informally as “the Tesla bill,” which would allow Tesla to open stores in CT. (It goes beyond Tesla as there are

other EV startups looking at this model). This is a politically fraught topic, but what is most disappointing is the way that politics seems to have influenced what is supposed to be a comprehensive policy document. Doing away with the antiquated dealer franchise laws wouldn't cost the state a penny (it would generate revenue) and would accelerate EV sales immediately.

As of January 1, 2020, there were 11,677 EVs registered in CT. The Multistate ZEV (Zero Emission Vehicle) Action Plan that the state has signed onto calls for about 500,000 registered EVs by 2030.

Many of the subject areas covered in the Roadmap involve more than just DEEP. However, other states have already implemented pilot studies or EV-friendly policies. They've run the numbers, and they see that moving to EVs lowers pollution, saves money, and brings benefits to the grid. We can learn from them while simultaneously moving forward. CT is behind the curve, yet this Roadmap takes the scenic route.

CT Joins Lawsuit Seeking to Block Rollback of Fuel Economy Standards

CT Joins Multistate Lawsuit Against Attempt to Dismantle Obama CAFE

Standards

As was widely reported in the press yesterday, Connecticut is one of 22 states and the District of Columbia that filed a lawsuit to block the Trump Administration's attempt to dismantle the Obama CAFE fuel efficiency standards. This links to the press release from Attorney General Tong's office.

There are three parts to this legal action as listed in material from AG's office:

1. A petition for reconsideration pending with the EPA;

2. *California v. Chao*, Docket No. 1:19-cv-02826-KBJ in the U.S. District Court for the District of Columbia; and

3. *California v. Wheeler*, Docket No. 19-1239 in the U.S. Court of Appeals for the District of Columbia Circuit, which petitioned for review of SAFE Rule Part 1.

The administration's rulemaking seeks not only to pull back to a lower MPG standard (and the dirtier air and higher fuel costs for consumers that go with it), it also seeks to block California and other states from following a separate, more stringent standard, which is what the landscape looked like prior to President Obama negotiating the Clean Car Standards with the industry. That was the crux of the compromise: the industry agreed to boost MPG and in return they got standardization. Point number 3, which refers to a "review of SAFE Rule Part 1" addresses the California Clean Act Waiver and the ability of the CARB states to preserve it if the Obama EPA regulations are rolled back.

The 2016 federal mid-term review found that the carmakers had exceeded the minimum requirements to that point and recommended continuing with the second phase through 2025 when the standard tops out at 54.5 MPG for passenger cars and

light-duty trucks.

This blog is supportive of the action being taken by AG Tong and the other states. The Obama CAFE rules were not EV-specific, but more aggressively transitioning to zero-emission electric vehicles is the way to most effectively meet (and exceed) the standards.

The Long and Winding Roadmap

DEEP EV Roadmap Released

The final version of the long-awaited Roadmap was publicly released a few weeks ago. For those of you who are in the weeds with EV policy, at 104 pages, plus 358 footnotes, and an appendix, this is the doc for you!

The report is divided into 16 sections and covers the waterfront in terms of all of the policy areas that could be actioned to support more rapid EV adoption. These include optimizing for grid impact; infrastructure; the role of utilities; incentives; fleets; light, medium, and heavy-duty vehicles; building codes; environmental justice; and others. The large volume of research that went into this provides useful background information and, importantly, descriptions of experiences from other states, particularly with respect to incentives and utilities (or EDCs, for electric distribution companies, in the argot of the report).

We will be diving into some of the sections covered in the report in more detail, but these are some top of mind thoughts.

We have a long way to go. There are 11,677 registered EVs in the state as of January 1, 2020, but the Multi-state ZEV Action Plan that CT has signed onto calls for about 150,000 EVs by 2025 and 500,000 by 2030. ZEV in this context refers to battery electric vehicles (BEV), plug-in hybrid vehicles(PHEV, and fuel-cell electric vehicles (FCEV).

We are behind the curve in many respects when it comes to enacting EV-friendly policy. Even the phrasing of the recommendations is often in very preliminary language. For example, "DEEP will explore pilot programs for EVSE deployment at MUDs." Many states have pushed further than CT has. The flip side of this is that CT can learn from them. There just needs to be some urgency about doing this.

The Roadmap notes that the "travel provision" in the ZEV plan was closed in 2018. This allowed manufacturers to earn compliance credits in other states for vehicles sold in California. The closing of this provision is intended to yield a greater number of EV models for sale in CT and the other states in the Northeast.

There are two things that could be done tomorrow (more or less) to increase EV sales that come at no cost.

The first is a glaring omission from the Roadmap, which makes no mention of permitting direct sales, more than likely a landmine upon which they did not want to tread. This refers to the years' long effort by Tesla to open stores in CT, and the campaign by the legacy automakers and dealers, successful to date, to stop them through the use of the decades-old franchise laws. As has been noted by this blog numerous times, Tesla sells more EVs than all of the other automakers combined, and they could sell more if they were able to open

stores and additional service centers.

Also, as has been noted by this blog on numerous occasions, but worth repeating, EV Club of CT is not a Tesla club. We want to see everyone selling EVs, and we wish the other automakers were as effective on the showroom floor as they are with their lobbying. We just call it as we see it.

In order for direct sales to happen, there needs to be legislation. Past attempts to craft a legislative compromise ended up with language that was narrowly tailored so that the carve-out would only apply to Tesla. We feel the world is changing and that the marketplace should flourish with new ideas. There should be provision for new EV companies, including but not limited, to Tesla, and new means of vehicle ownership (e.g. subscription). New entrants are poised to come online in the next year or two.

The other item that could be done forthwith is adjusting the CHEAPR parameters. The most recent set of changes is causing CHEAPR to pace about 75% under a budget that isn't that large to begin with. There has been language on its website for months stating there could be changes in 2020. The legislature also authorized a rebate for used EVs. The Roadmap recommends contracting with an experienced program administrator to develop and implement such a program, which makes it sound a long way off. More on this in a future post.

Funding

There are various funding-related issues discussed in the report, such as the different funding mechanisms that have been used for incentives and the VW Settlement funds, of which $55 million-plus is being allocated to CT. Also part of the VW settlement is the installation of charging infrastructure under the moniker of ElectrifyAmerica. Of particular importance is the Transportation Climate Initiative (TCI), a major multistate cap and invest initiative to curb tailpipe

emissions, which will yield funds (no specific number or date available as yet), some of which can be invested to support EV adoption efforts.

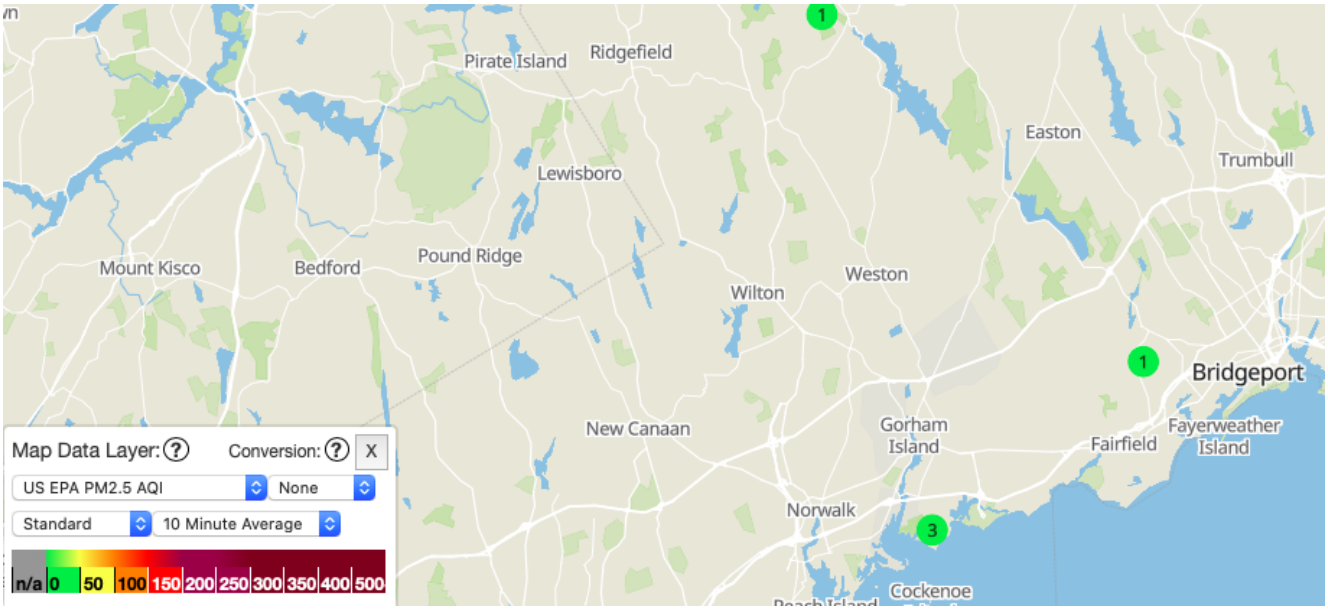
We encourage everyone to read the Roadmap and share comments with the club.

Low Emissions Plus a Storm Makes for a Perfect Storm for Air Quality

The photo above of the Hartford area air quality, with readings of zero, means that in order to have cleaner air, you'd have to live on the moon. Air quality was already hugely improved as a result of the COVID related lockdown which has shuttered industry and greatly lessened traffic volume. Add to that a storm system that moved through the area yesterday, followed by high winds today, and we now have a "breathe deeply" moment.

As we have said in previous posts, we have an opportunity as a society, to implement measures going forward to maintain this level of air quality.

Below is Fairfield County. Not quite perfect, but close.



Air Quality Reading from PurpleAir.com

For comparisons to what air quality typically is in recent years in this area, which ain't great, see our earlier post. It contains historical images from PurpleAir and NASA.

CHEAPR Rebates Up as Car Sales Plummet

First Quarter Sales Results Were Terrible for the Industry, but a Sliver of a Silver Lining for EVs

The first-quarter economic data were just released and as bad as expected (GDP down 4.8%) with worse to come.

According to Automobilemag.com, nationally, automobile sales were down 12% for Q1 year over year because of a 41% decline in March.

Only two manufacturers reported a quarterly gain. Kia was up 1% and Tesla was up 40%. All others fell by as much as 30% (Nissan). Since Tesla basically carries EV sales, it is possible that EV market share is up for the quarter. General Motors was down 7%, but the Chevrolet Bolt was up 36%. That could be due to this being the final quarter of the phase-out of the federal tax incentive for GM, which is over the 200,00 unit sales threshold. It now joins Tesla as the only manufacturers that no longer have the benefit of this tax credit. We await final data for other EVs.

Despite a stronger than expected earnings call from Tesla, and after-hours momentum for the stock, there was some unfortunate hyperbole from Elon Musk over the temporary closure of its manufacturing plant in Fremont, CA. (Its plant in China is re-opening.) The company is ahead of schedule in its rollout of the Model Y, which is expected to be an even stronger performer than the Model 3. The economy may be cratering, but their problem seems to be more supply than demand.

CHEAPR Rebates Run Countertrend and Rise in March

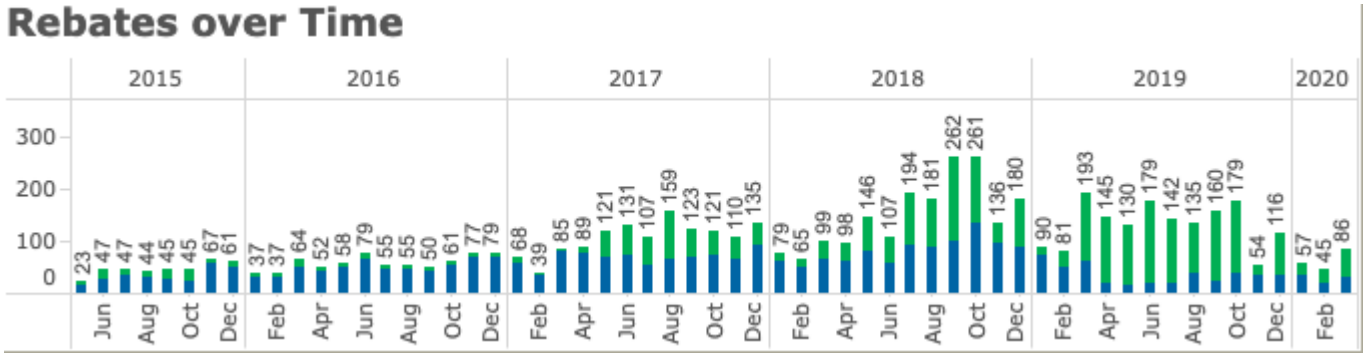
March was clearly the worst month of the quarter by far, but CHEAPR rebates actually rose relative to January and February. As shown in the graph at the top of the post, this is almost completely driven by the Model 3, despite the fact that only the most basic trim level falls under the revised MSRP cap of $42,000. 39 of the 86 rebates in March were for the Model 3, a lower percentage than it was before the change in October 2019, but still surprisingly high.

CHEAPR data are loaded through March 31. They typically update monthly and lag about a month.

Despite the March spike, the annual run rate based on a straight-line projection of the quarter is only $756,000,

still well under the $3 million allocated. The messaging remains on the CHEAPR website that revisions to the program are coming this year, but, hey guys, it’s almost May!

This is a screengrab from the CHEAPR website showing rebate levels by month from inception through March 2020. The levels rose as EVs gained more traction and, in particular, Tesla launched the Model 3, but then fell after the changes in October. The green shading is for BEVs and the blue is for PHEVs. The amount of green shading has increased and is driven primarily by the success of the Model 3, the discontinuance of the Chevrolet Volt, and a softening in the number of rebates for the Toyota Prius Prime. The introduction of the Chevrolet Bolt and Nissan Leaf Plus have had a more modest impact.



This is What an EV World Could Be

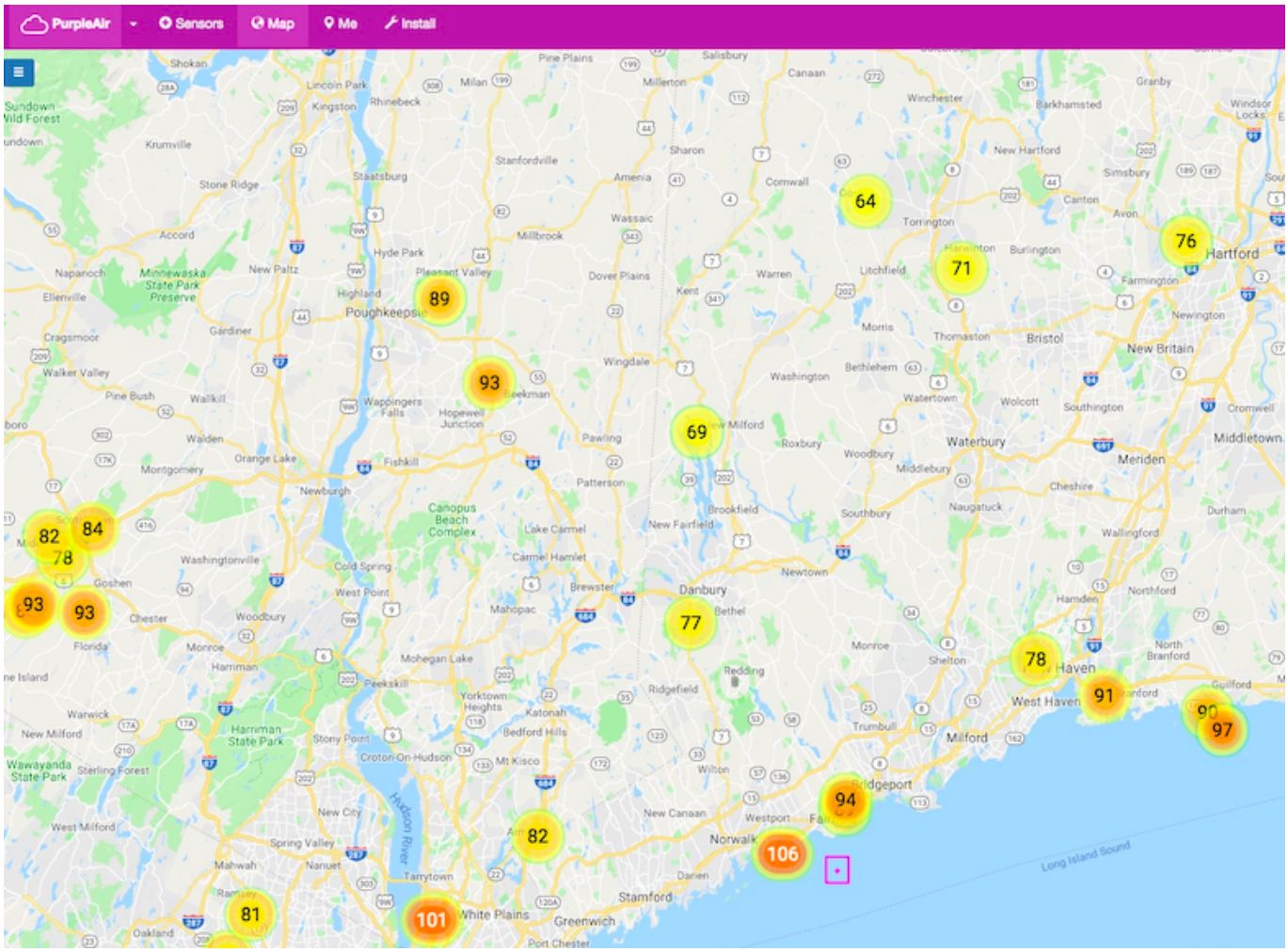
Coronavirus has given us clean air. EVs could, too.

The photo above is from PurpleAir, which is a WiFi-connected, networked, sensor. The date is April 11, 2020. Individuals can

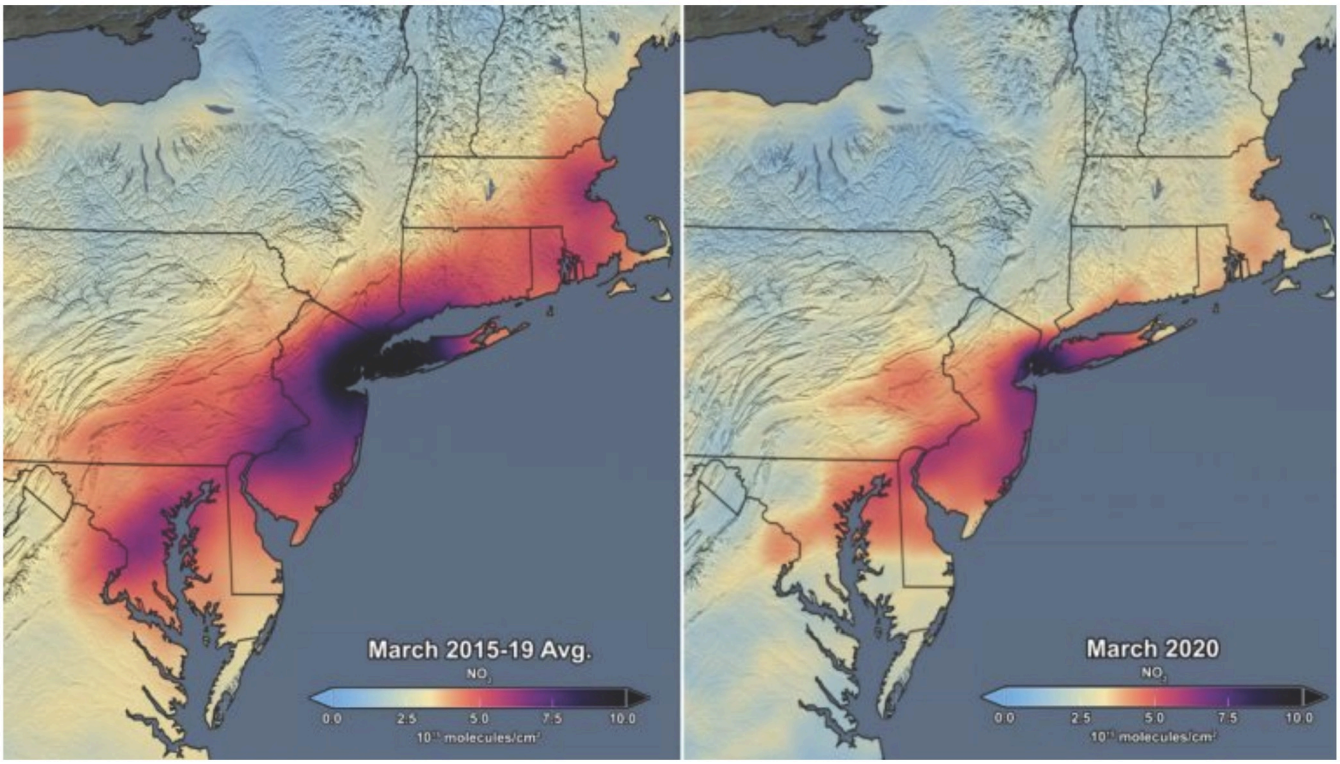
buy these and the results are collectively monitored in real-time. Users have the ability to use an app to drill into the data to isolate specific geography. See all those green dots? That never happens in Fairfield County, the part of the state with the worst air pollution. It could, though. This is what an EV world (along with mass transit and bikeways) could be like.

And maybe it will be. An article in Elektrek reports that a study shows consumer intent to purchase EVs is on the rise as a result of this breath of fresh air we have been experiencing. The short-term outlook for EVs is bleak with a recessionary economy and low gas prices, but it would be a silver lining if this served to wake people up to what is possible.

This is a PurpleAir screenshot from 2018. Any value over 25 is, to some degree, unhealthy. Yellow is bad. Orange is very bad.



NASA has also published images, in this case before and after for the Northeast, showing the impact of the coronavirus social distancing measures yielding a 30% decline in nitrogen dioxide. A picture really is worth a thousand words.



This image released by NASA shows the average concentration of atmospheric nitrogen dioxide in March of 2015-19. (left), compared to March of 2020. (NASA/NASA's Scientific Visualization Studio)

NASA satellite data has shown a 30 percent reduction in atmospheric nitrogen dioxide pollution in the northeastern U.S. during the coronavirus lockdown.

According to ABC News, a study conducted by Harvard's T.H. Chan School of Public Health found that "people with COVID-19 who live in areas with high air pollution levels are more likely to die than those who live in less polluted regions." The study reported that "a small increase – one microgram per cubic meter – in long-term exposure to particulate matter leads to a 15% increase in the COVID-19 death rate." They caution that findings are preliminary. It certainly makes intuitive sense.

As reported in the LA Times about a recent clean-air day in California, "If I could wave my magic wand and we all had electric cars tomorrow, I think this is what the air would look like," said Ronald Cohen, a professor of atmospheric chemistry at UC Berkeley who has been studying the effects of the stay-at-home orders on air quality.

Coronavirus is a high price to pay to experience cleaner air. With the expanded use of EVs, we can keep it that way.

EV Club Presentation to Go Virtual

EV Club president, Bruce Becker, will present to the Humanists and Free-Thinkers of Fairfield County

This is the text of the press release describing the engagement:

HFFC MOVES TO ONLINE MEETINGS – ELECTRIC CARS, APRIL 13

The program on the Future of Electric Cars has been changed from an in-person presentation to an online video presentation, as the host, the Humanists and Freethinkers of Fairfield County (HFFC) has changed all its meetings to online video. Members of the public can get the link for free admission by sending an email to hffc@optimum.net with "EV" as the subject line, and with person's name in the text.

The program will be Monday, April 13, 6:45 enter online, & preliminaries. 7 pm program. The number of participant devices is limited.

The speaker is Bruce Becker, President of the Electric Vehicle Club of CT, LEED architect, and president of Becker + Becker, an architecture and development firm focusing on sustainable projects (with low or net-zero energy use). In his talk, he

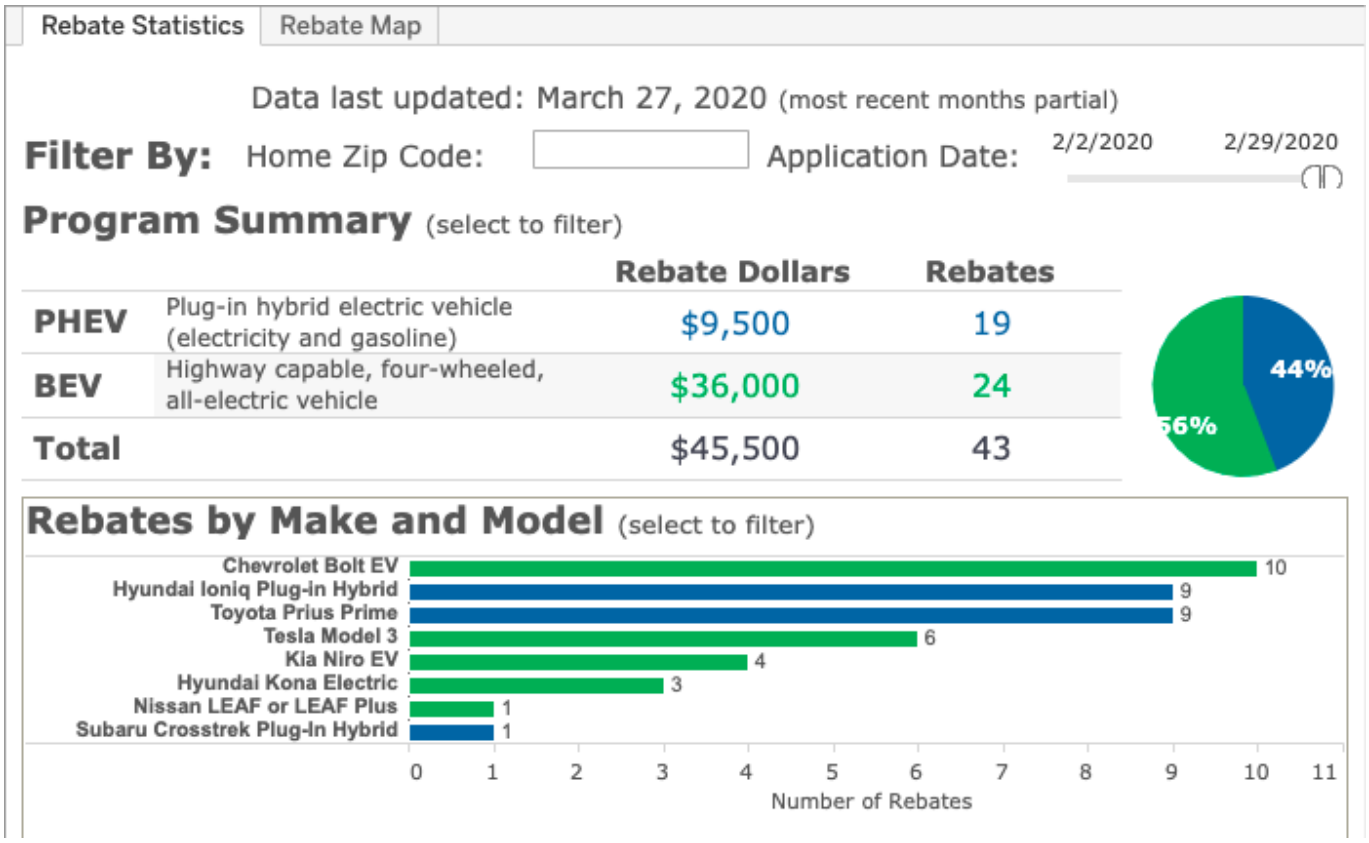
will discuss EV infrastructure needs and how planning at both state and town levels can accelerate EV adoption. He will also answer questions about sustainable options for construction and development. Come hear the discussion about sustainability on our roads and in our towns.

CHEAPR Update and COVID Outlook

CHEAPR Rebates – The Doldrums Continue

Given the after-effects of the change in rebate parameters, the numbers seen in the graph were not a surprise. This information dates through the end of February, which is the latest that has been released on the CHEAPR stats page.

The detail for the month is below:



February saw low rebate numbers, continuing the trend from January and Q4, due to the lack of improvements in the CHEAPR rules. The economic impact of COVID-19 has yet to be visible in this timeframe

The balance tipped slightly to BEVs because Bolt rebates increased while both Ioniq PHEV and Prius Prime rebates decreased. Tesla remains at a very low level since all but the most basic trim level of the Model 3 are now excluded. Deliveries of the Model Y have begun, though we don't know how long it will be before volume ramps. That vehicle runs a few thousand dollars more than the Model 3 so we don't expect it will qualify for rebates.

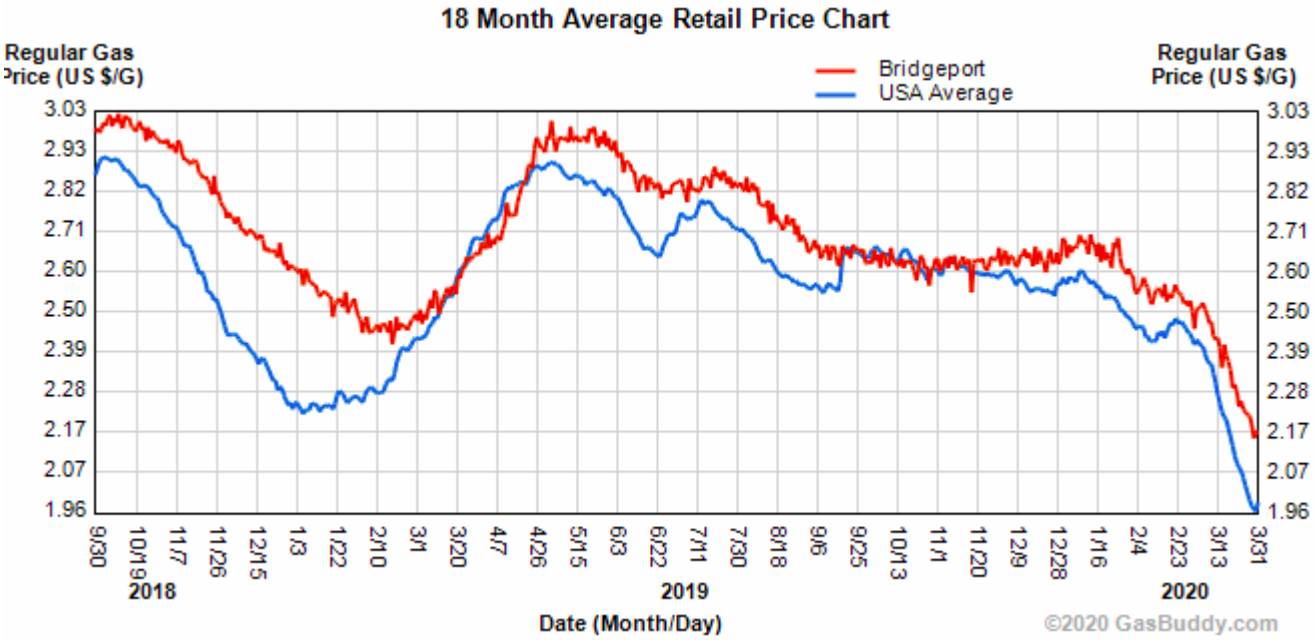
Last we heard, the new CHEAPR board was not completely filled, but they have a quorum. All that's been done has been to extend the same parameters that were in effect in Q4 2019 into 2020. One-quarter of the way into the new year, there is still no news on promised revisions or on used EV purchase incentives.

As can be seen on the screenshot from the CHEAPR stats page, there was a total of $45,500 in rebates that were disbursed. This works out to $546,000 annually on a straight-line basis, against a budget of $3 million.

It is likely to be a difficult road ahead for at least the next few months. We can't rule out the possibility that federal aid meant to counteract the impact of the recession on state finances will be inadequate. Early signs point to that being the case, as evidenced by what Governor Cuomo of NY had to say at a recent press conference. Budget cuts are inevitable and we wonder if CHEAPR will fall victim to that.

Plummeting Oil and Gas Prices

Part of this environment is plummeting gasoline prices. This is a recent chart from Gas Buddy and, well, you get the idea. The blue line is national and the red line is Bridgeport, CT.



Gas prices, or more specifically, the price per barrel of oil, are falling not only because of reduced demand from a recessionary economy exacerbated by social-distancing measures but also because of a price war between Russia and Saudi Arabia. Either one of those things would have caused this, but

in this instance, demand began to fall, OPEC wanted to implement production cuts, Russia did not go along with it, and now Saudi Arabia is aggressively cutting prices, presumably to pressure Russia. This has accelerated the fall in the price per barrel. Absent some interim mediation, the next OPEC meeting is in June.

This could have knock-on effects for American (and other) shale oil, which according to Investopedia, has a floor price of anywhere from $40 to $90 per barrel. (This could be part of why Russia wants to do this.) Below is a chart of oil price trends. Shale oil is a heavily leveraged industry, so the impact could conceivably be felt in the bond market.

Source: oilprice.com

This blog is not a fan of shale oil. Fracking is environmentally destructive and produces a tremendous amount of natural gas, most of which is being flared at the well, spewing greenhouse gas emissions.

This week we also had the news of the administration formally implementing the rollback of phase 2 CAFE, though the question of whether the CARB states can return to a separate standard is still being litigated. This move will please the fossil-

fuel industry. The rest of us lose. Even the automakers are less than enthused. It will accelerate carbon emissions, cause more sickness and death from air pollution, and, according to a report in the NY Times, and based on the administration's own data, it will impose an economic cost on society as high as $22 billion.

Opportunity, Should Policy Makers Choose to Make Something of it

Despite the headwinds, there is likely more stimulus to come and this could be an opportunity. The first packages rightly focused on stanching the bleeding with unemployment insurance and support for small businesses. When the outbreak wanes, there will still be a need for fiscal stimulus. It is an opportune moment to craft such legislation so that it includes renewable energy infrastructure and purchase incentives. Wouldn't it be nice to replace lost shale oil production with renewables and stationary storage?

Renewables and energy efficiency measures were a successful aspect of the 2009 stimulus legislation. And from that previous experience, it follows that there are data. They know what worked. This could help policy-makers to understand how to best incorporate long-term climate change objectives within short-term stimulus needs. Also, the energy-efficiency part of the 2009 stimulus did not include building infrastructure to better defend against severe storms and rising sea levels, which have now become a fact of life. This supports both resiliency and job creation. If this administration does not have the foresight to understand this, then perhaps we'll have to wait and see if there's a new sheriff in town in 2021. The passing of more legislation will almost certainly continue into next year.

In the meantime, it falls to us to accelerate EV adoption, one person at a time.