GREEN ENERGY CONSUMERS ALLIANCE

To: Dan Gatti, Director of Clean Transportation Policy at Massachusetts Executive Office of Energy and Environmental Affairs, and David Ismay, Undersecretary, Climate Change
From: Green Energy Consumers Alliance
Date: June 24, 2020
Re: Policy Recommendations for the Accelerated Electrification of Light-Duty Vehicles in Massachusetts

Green Energy Consumers Alliance (Green Energy Consumers) has been running the Drive Green program in Massachusetts and Rhode Island since November 2016. So far, Drive Green has helped over 2,000 individuals sign up to test-drive an electric vehicle (EV) and facilitated nearly 800 purchases or leases. Through the program, Green Energy Consumers has worked closely with both consumers and car dealers and learned a lot about the barriers to widespread EV adoption from both perspectives. Based on this programmatic experience and our experience advocating for smart transportation policy, we have some ideas about which policy interventions can help accelerate the transition to electric transportation in the Commonwealth.

This memo is designed to answer the question: **What do we need to do in Massachusetts over the next one to five years (in other words, by 2025) to put Massachusetts back on track towards electrifying light-duty vehicles (LDV)?**

At this point, we know that Massachusetts will be unable to achieve its ZEV goal of 300,000 EVs. If we can't reach 300,000 by 2025, what should our goal be? We considered several reference points – the Commission on the Future of Transportation[i], the Mass. Comprehensive Energy Plan[ii], market share data in California[iii], the 2019 Brattle Group report, *Achieving 80 Percent GHG Reduction in New England*[iv], and the Northeast Regional Assessment of Strategic Electrification conducted in 2017 by Synapse Energy Economics. All point to a needed increase on the same order of magnitude: Massachusetts needs to ***more than triple the rate of EV adoption*** (currently ~1-2%) by 2025. In 2018, the height of EV adoption in Massachusetts, about 9,000 residents purchased or lease an EV. Three times that gets us to ~***30,000 EVs per year by 2025***. If overall car purchases do not change, that tripling would bring us to ~6% market share, closer to California's *current* market share of 8.55%

So: how do we reach 30,000 EVs sales per year? We strengthen MOR-EV, direct electricity suppliers to offer off-peak or time-of-use pricing, support consumer education, make better data available to the public, and center equity in all of the above.

1. Turbocharge the MOR-EV program

Currently, the only direct incentive offered to consumers to make the switch to EVs in Massachusetts is the MOR-EV rebate. In January 2020, the state dedicated $27 million to the program each year for two years. We consider this investment of $54 million as one pillar of a bridge to support the market as battery prices come down and until the point where EVs reach cost-parity with gas-powered cars (expected to occur sometime between 2022 and 2030 in the U.S.) Under the current program parameters and market conditions, the state will not be able to spend out the $54 million it has allotted; we need to change the parameters of the program (within the bounds of the legislature's authorization) to achieve the market transformation necessary to get on the right trajectory.

Reinstated in January 2020 after a brief pause, MOR-EV now offers a $2,500 rebate for the purchase or lease of a battery-electric vehicle (BEV) with a sales price under $50,000 and a $1,500 rebate for the purchase or lease of a plug-in hybrid electric vehicle (PHEV) with a sales price under $50,000 and at least 25 miles of range on electricity. If we assume that all of those $54 million go straight to consumer rebates, we could fund $2,500 rebates to 21,600 BEV purchases over the next two years. While this is only about a third of what is needed to get on the right trajectory, market conditions in 2020 are such that it is highly unlikely that this money will be spent out unless we change the MOR-EV formula.

In 2019, MOR-EV only issued $2,996,450 in rebates (for 1,876 vehicles). Granted, the program did not exist for the last three months of the year and, for the rest of the year, excluded PHEVs and only offered $1,500 for BEVs. However, even with the higher rebate amount and the re-addition of PHEVs, there is no reason to believe that nearly six times as many people will apply for the MOR-EV rebate in 2020 as did in 2019 ($27 million funds 10,800 $2,500 BEV rebates, which is 5.75 times as much as 1,876). So far, the biggest year-on-year growth in EV rebates has been a doubling, from 2017 to 2018, so a sixfold increase is truly unprecedented. With the advent of COVID-19, it is more unlikely than ever that the $27 million will be spent in 2020.

Figure 1: MOR-EV Rebates Issued, By Year

Year	MOR-EV Rebates Issued	Percent Growth Over Previous Year
2015	980	
2016	1,412	40%
2017	2,750	95%
2018	5,815	111%
2019	1,876	-68%

We believe that the structure of MOR-EV should be changed to (a) ensure that we take full advantage of the $54 million dedicated to this incentive program and (b) better serve low- and moderate-income drivers looking to electrify their transportation (as noted by the CFOT in its report).

Increase the rebate to $5,000 for BEVs and make it point-of-sale.

Section 95 of the Supplemental Budget passed in December 2019 states that: "the department of energy resources shall offer rebates of *not less than $2,500 and not more than $5,000* for the purchase or lease of battery electric vehicles… for sale or lease with a retail price of not more than $50,000" (emphasis added). However, in implementing the program, the Department of Energy Resources (DOER) has limited the rebate for BEVs to $2,500. Without needing to return to the Legislature, DOER could increase the rebate amount, which would provide a greater incentive to electrify and be more useful to lower- and moderate-income drivers too.

Obviously, increasing the rebate will decrease the number of vehicles MOR-EV can support, to about 10,000 BEVs over two years. We understand this concern but feel that since the state will not be able to spend out the allocated $54 million, increasing the rebate – in addition to the other strategies outlined in this memo – is warranted, both to accelerate EV adoption and address some of the equity concerns around the MOR-EV rebate. In other words, we feel that the market will be better conditioned at the end of 2021 if 10,000 BEVs are definitely sold with $5,000 rebates than if 5,000 were sold with $2,500 rebates, leaving millions of dollars unspent.

In a report commissioned by the Sierra Club, Synapse Energy Economics indicated, based on its EV-REDI model, that in order for the state of New York to achieve the levels of transportation electrification required to meet the state's greenhouse gas emissions reduction goals, the state rebate for electric vehicles in New York should be increased from $2,000 to $3,800 (assuming society also largely transitions to other modes of transportation, like walking, biking, and transit) or $5,000 (without mode shifting). From the EV-REDI model, Synapse was able to assert that the $5,000 figure was necessary (along with expected battery cost reductions over time) to reduce the difference between EVs and internal combustion cars sufficiently in order to increase EV sales. In our opinion, the model's results for New York logically apply to Massachusetts as well.

In addition, making the rebate point-of-sale will increase the accessibility of the rebate, thereby both increasing the likelihood that the $54 million will be spent out and opening the rebate up to those for whom waiting months for a reimbursement of several thousand dollars is a significant barrier to EV adoption.

Expand the rebate to certain market segments.

Currently, only individual consumers purchasing or leasing new vehicles for personal use (not business use) are eligible to apply for the MOR-EV rebate. Businesses, municipalities, universities, and other organizations are excluded, as are pre-owned EVs. Massachusetts needs to electrify as many vehicles on our roads as possible; expanding the scope of MOR-EV would allow for that. Specifically, we recommend expanding MOR-EV to cover:

1. Fleet and/or delivery vehicles, owned by private companies, non-profits, or governmental agencies: These vehicles, with fixed, predictable routes, high usage, and operators thinking deeply about the total cost of ownership, are a great use-case for EVs.
2. The vehicles owned by non-profit organizations serving people in environmental justice (EJ) communities: People in these communities suffer disproportionately from the health and climate impacts of burning fossil fuels for transportation and generally do not have access to the benefits of EVs due to financial barriers. Replacing some of the vehicles that regularly drive through and pollute streets in EJ communities with EVs is a public health strategy. Additionally, these non-profits can benefit from the lower fuel and maintenance costs associated with EVs.
3. Used EVs: EVs that were purchased new in Massachusetts do not always stay in Massachusetts when they enter the used car market. Extending the MOR-EV rebate to used EVs will both help keep these EVs (and their public health and climate benefits) in Massachusetts *and* make electric mobility more accessible to low- and moderate-income residents.

We believe these suggestions are consistent with Section 95 of the Supplemental Budget. In addition, we would particularly encourage the administration to investigate replicating the Clean Cars 4 All program of the California Air Resources Board. This scrap-and-replace program provides incentives to low-income drivers to replace vehicles that are over fifteen years old with a new or pre-owned EV (incentives for BEVs are up to $9,500). Drivers who scrap old vehicles can also opt for incentives towards other modes of transportation, such as electric bikes or public transportation. We think this model is worth considering in Massachusetts.

Invest in better marketing.

Currently, neither the state nor the Center for Sustainable Energy (the MOR-EV program administrator) seems to actively market the MOR-EV rebate. Prospective EV owners find out about the rebate via outreach and education from organizations such as Green Energy Consumers, a google search, or perhaps from a car dealership. By building a presence on social media, the program could reach many more prospective EV owners for a very low cost. Specifically, we recommend:

- Posting regularly on Twitter. There is a MOR-EV Twitter account, but it has not been active since August 2019. By posting more regularly about EVs in general and the MOR-EV program specifically, and by retweeting other organizations sharing information about electric vehicles, the reach and influence of this account could grow to the point where it alerts people who do not know about MOR-EV to the program's existence.
- Setting up a Facebook account. Facebook would allow the MOR-EV program to reach another digital audience. Facebook would also allow for the posting of Facebook ads, which can cost-effectively target consumers who may have an

interest in topics (such as the environment, new technology, public health, or cars) that might predispose them to being interested in EVs.

2. Direct electric utilities and competitive electricity suppliers to offer off-peak discounts for EV charging and/or time-of-use (TOU) pricing.

Whether the $54 million dedicated to MOR-EV is spent in two years or more, the rebate alone is not sufficient to transform the market. And we do not believe that the Commonwealth will find a similar source to fill MOR-EV's coffers after the $54 million is spent. Therefore, we need to implement other incentives. Off-peak charging is another pillar of the bridge needed to condition the market until EVs reach cost-parity with gas-powered cars.

Off-peak charging rebates should be adopted at scale because of the benefits they provide to the grid. Properly administered, off-peak rebates (or time-of-use pricing (TOU)) can also provide a strong incentive for drivers to purchase or lease an EV. *It's the combination of benefits that makes off-peak charging deserve far more attention than it has received thus far.*

The state should direct electricity suppliers to offer off-peak discounts or TOU pricing because this truly self-financing approach will further incentivize EV adoption *and* benefit the grid and all ratepayers. Our recommendation is in line with the CFOT's assertion that "utilities should be encouraged to establish off-peak pricing programs that give car, bus, and truck owners and operators an incentive to charge their vehicles during off peak hours, and to the extent technically feasible, to sell electricity back into the grid at peak times."

TOU pricing promotes off-peak charging, thereby making better use of our electric grid infrastructure, and incentivizes EV adoption by lowering the fuel costs of driving an EV even more in relation to a gas-powered car. The two large investor-owned utilities in Massachusetts, Eversource and National Grid, are not moving fast enough on this critical piece of the EV puzzle.

There is ample evidence[v] from across the country that TOU rates work to shift charging behavior, to the benefit of EV drivers (lower-cost charging), the grid (smaller peaks), and ratepayers who *don't* own EVs (fixed costs of system spread across more kilowatt-hours (kWh); more efficient use of grid resources).

Eversource: Eversource currently offers a home charger demand response program in which electric customers in Massachusetts with a wifi-enabled Level II ChargePoint charger can earn up to $300 over three years by permitting Eversource to adjust their charger's energy use during moments of peak demand. Though this program does represent a first step into making use of the flexibility of EV load, this offer is *not* a time-of-use rate.

National Grid: In its most recent rate case, National Grid in Massachusetts was approved to launch a residential off-peak EV charging program. With the off-peak period defined as 9 pm to 1 pm, National Grid calculated a rate reduction of 5 cents per kWh during summer months (June to September) and a 3 cent/kWh rate reduction in winter months (October to May) based on the difference in wholesale electricity rates. The roll-out of the program has been put on hold due to the impacts of COVID-19, but once driving habits return to some semblance of normal, National Grid will launch the program as a *study*: EV drivers will enroll and allow the utility to access data on their driving and charging habits. After one year of data collection, National Grid will split the pool of EV drivers into two groups (a control group and a group with the time-of-use rates) to study the impact of this price signal on behavior.

Sizing the Off-Peak Discount

So far, the discussion of sizing the off-peak discount between the utilities and the Department of Public Utilities (DPU) has centered on the difference between peak and off-peak wholesale electricity rates. This narrow focus produces a rebate value that is too low and therefore not optimal because it fails to account for key benefits, such as avoided costs relating to transmission, distribution, and greenhouse gas (GHG) reduction. If EVs were evaluated in a manner similar to the way efficiency measures are evaluated in the MassSave program, those avoided costs would be incorporated into the Benefit-Cost Analysis. When we add those items together we find a value of about 12 cents per kWh. To that, one could also add the 1-2 cents per kWh that charging the car would pay into the MassSave program, bringing the grand total benefits of the off-peak charging to 13-14 cents per kWh, which is more than half of the prevailing retail rates charged by National Grid and Eversource. In this discussion it's worth highlighting a very important point: ***A discount tied to the avoided costs is not a subsidy to EV owners financed by non-EV owners and will not result in higher rates.***

If one assumes that the average BEV will consume 3,000 kWh per year and that an effective off-peak charging program would result in 75% of that consumption to be off-peak, the consumer would save about $300 per year. National Grid had proposed that its off-peak discount be coupled with a rebate of up to $1,000 for the installation of a WIFI-enabled Level II residential charging unit, but the DPU unfortunately rejected the charger rebate piece. Together, the combination of the off-peak discount and the Level II rebate, supported by effective marketing, would have been a powerful, and financially self-sustaining inducements to adoption. We encourage the administration to be proactive in calling for statewide off-peak charging rebates.

3. Support consumer education.

The lack of effective consumer education is one of the largest market failures slowing down EV adoption. Most consumers either do not know about the technology, available models, incentives, and benefits of EVs, or have misconceptions around their viability, affordability, and safety. Car manufacturers (original equipment manufacturers, or OEMs) have not invested in widespread or effective marketing for these vehicles and no other actor has successfully stepped into the vacuum left by OEM's lack of action. Dealerships notoriously do a poor job of explaining and selling EVs to prospective buyers. The CFOT recognized this need when it urged the state to "[increase] support for grassroots EV consumer marketing and bulk purchasing programs".

In Massachusetts and Rhode Island, Green Energy Consumers Alliance has addressed this market failure through our Drive Green program. Through our program website, social media, webinars, presentations, EV showcases and ride & drives, and work with partner organizations and community groups across both states, we have educated thousands of people about EVs. More of this kind of community-based social marketing is needed to accelerate the adoption of EVs in Massachusetts. In fact, in 2019, the Massachusetts Clean Energy Center awarded Green Energy Consumers Alliance a $90,000 grant to support the Drive Green program.

While this may be self-serving, we assert that some dollars devoted to public education and community-based social marketing will be very cost-effective insofar as they would multiply the benefits of a "MOR-EV-only" approach.

4. Make better data about EVSE and rate discounts available to the public.

Both Eversource and National Grid have Make Ready programs that are facilitating the build-out of electric vehicle supply equipment (EVSE) across the state. However, it is not public knowledge *where* those stations are being built. Concerns over access to public charging are one of the biggest barriers to EV adoption; if more Massachusetts residents had better information about how many and where EVSE sites are and that more were being constructed more would consider making the switch. Websites and apps such as PlugShare can show Massachusetts residents where the nearest EV charging is, but these are used mostly by *current* EV drivers; *prospective* EV drivers largely do not know they exist.

To smoothly accelerate the transition to electric vehicles, the build-out of EVSE should be a little bit ahead of EV adoption. Without access to information held by the utilities about the location and type of EVSE being built out with Make Ready funds, advocates cannot appropriately scrutinize progress made to date or speak to what funding will be needed moving forward.

A note on equity

How to *equitably* accelerate the transition to electric transportation is the topic of much conversation within Massachusetts and the rest of the country. Clearly, we cannot MOR-EV our way to 300,000 EVs with a state rebate alone; doing so would be neither efficient nor equitable. With respect to this important topic, we would urge the Commonwealth to:

- As already mentioned above, increase the MOR-EV rebate, expand it to include pre-owned vehicles, and help service organizations working in EJ communities or serving the most vulnerable to electrify their fleets (both for public health reasons and cost savings).
- Recognize that transportation is not limited to personally-owned vehicles and move swiftly to provide better public transportation in EJ communities *and* electrify transit buses, prioritizing those routes that run through heavily polluted communities.

If the state wants to pursue community-specific pilot projects in EJ communities, we urge it to begin any such project with a thorough needs assessment and to make sure to follow the lead of local voices.

Final Thoughts

In addition to these major pillars, we support the expansion of HOV lanes to access by EV drivers and suggest that the criteria used to confer Green Community status be updated to include some measures relating to EV adoption, such as municipal vehicle procurement, siting EVSE on public property, etc.

Taken together, we believe these strategies will better support the state market until battery prices have decreased enough that EVs reach cost-parity with gas-powered cars. In our experience and research, we have found that EVs are adopted at much higher rates and in more applications where the government is “all-in”, such as in Norway, Denmark, California, and China. In these locations, not only are electric passenger cars penetrating the market, but we see medium- and heavy-duty vehicles, two- and three-wheelers, ferries, construction vehicles, etc., as the authorities have figured out the technological and business model issues associated with the categories (including interconnection and distribution system upgrades). There are huge benefits to this “all-in” approach because it leads to better quality, economies of scale, and much greater public awareness.

We thank you for your consideration and welcome your feedback.

[i] The Commission on the Future of Transportations' (CFOT's) *Choices for Stewardships: Recommendations to Meet the Transportation Future (Volume I)* recommends that the state establish a goal that all new cars, light-duty trucks, and buses sold in the Commonwealth be electric (or zero-emission) by 2040. If we assuming linear growth from ~1% market share in 2020 (recognizing that technology adoption does not grow linearly, but using this approach as a baseline), we would need 25.75% of new cars sold in Massachusetts to be electric in 2025 to be on track to meet the 2040 goal.

[ii] The Massachusetts Department of Energy Resources' (DOER) *Comprehensive Energy Plan* assumes two-thirds of new vehicles to be electric by 2030; so by 2025, we should be around 33%.

[iii] According to the Alliance of Automobile Manufacturers' Advanced Technology Vehicle Sales Dashboard, battery-electric vehicles (BEVs) made up 5.73% of light-duty sales in California from July 2018 to June 2019, the latest complete year for which data is available. In the same period, plug-in hybrid vehicles (PHEVs) made up 2.82% of light-duty sales in California. In Massachusetts meanwhile, BEVs made up 1.74% and PHEVs made up 1.03% of light-duty sales. So, a reasonable goal for Massachusetts would be to reach 8.55% market share of light-duty vehicles in five years, which is more than three times its current rate of EV adoption.

[iv] The Brattle Group in its recent report, *Achieving 80 Percent GHG Reduction in New England by 2050*, asserts that EV market share for light-duty vehicles needs to be 90% in 2050 for the New England states to meet their 2050 emissions targets/requirements (up from 1% in 2020). If we assume technology adoption grows linearly (which it does not, particularly not with disruptive technologies), we would need ~16% market share in 2025 to be on track to meet the 2050 goal.

[v] See The Citizens Utility Board *Charging Ahead* report, the Smart Electric Power Alliance's "What We Know About Utility EV Rates For Residential Customers", and the Regulatory Assistance Project's *Rate Designs That Work for a Modern, Customer-Oriented Grid*, for example.