Comments of the
Association of Global Automakers, Inc.
on
"California's Advanced Clean Cars Midterm Review:
Summary Report for the Technical Analysis of the Light Duty Vehicle Standards"

I. EXECUTIVE SUMMARY

The Association of Global Automakers, Inc.[1] (Global Automakers) appreciates the opportunity to comment on California Air Resources Board's (ARB) "California's Advanced Clean Cars Midterm Review: Summary Report for the Technical Analysis of the Light Duty Vehicle Standards" (Midterm Review or Staff Report). This Midterm Review is an important opportunity for ARB to reassess its Advanced Clean Car Program, which includes the state's greenhouse gas (GHG) emission program, Zero Emission Vehicle (ZEV) mandate and Low Emission Vehicle III (LEV III) standards. It is also an integral part of the "One National Program" for GHG and CAFE standards developed by the U.S. Environmental Protection Agency (EPA), National Highway Traffic Safety Administration (NHTSA), and State of California. The Midterm Review is intended to determine whether the MY 2022-2025 standards are still appropriate given that they were developed back in 2012 based on projections more than a decade into the future.

Global Automakers and our member companies are committed to the long-term goals of the Advanced Clean Car Program—reducing fuel consumption and lowering emissions of GHG and criteria pollutant emissions in the light-duty sector. The industry's effort in this regard is undeniable, as evidenced by the tremendous advances made in cleaner and more efficient internal combustion engines as well as a growing array of alternative-fueled vehicles, such as battery and plug-in hybrid electric vehicles, and groundbreaking fuel cell electric vehicles. These early successes speak to the ongoing ingenuity and resourcefulness of the auto industry, but they also highlight the need for a sensible regulatory framework for motor vehicle fuel economy and emissions.

A cornerstone of that framework is the One National Program, which is intended to establish a single set of harmonized regulations to achieve long-term improvements in motor vehicle fuel economy and reductions in GHG emissions. Global Automakers and our member companies signed up for the One National Program in part because it included a data-driven and transparent Midterm Evaluation coordinated among ARB, EPA and NHTSA. Now that the federal process has been reopened and

[1] The Association of Global Automakers represents international motor vehicle manufacturers, original equipment suppliers, and other automotive-related trade associations. Global Automakers works with industry leaders, legislators, regulators, and other stakeholders in the United States to create public policies that improve motor vehicle safety, encourage technological innovation, and protect our planet. Our goal is to foster an open and competitive automotive marketplace that encourages investment, job growth, and development of vehicles that can enhance Americans' quality of life. Our members' share of sales and production in the United States is nearly 45 percent and growing. For more information, visit www.globalautomakers.org.

been put back on the path that all parties agreed to back in 2012, Global Automakers looks forward to continuing our engagement with ARB and the federal agencies to ensure that the standards for MY 2022-2025 achieve meaningful reductions in motor vehicle emissions, while also providing customers with affordable vehicles that meet their needs.

To this end, we offer the following comments on the three aspects of the Midterm Review of the Advanced Clean Car Program: the Zero Emission Vehicle program, the Greenhouse Gas program, and the Particulate Matter standards under the Low Emission Vehicle Program.

Zero Emission Vehicle Program

One of the fundamental goals of the ZEV program has been to "act[] as the focused technology forcing piece" of California's vehicle emissions program, first to address criteria pollutant emissions and then later for the GHG program as well.[2] Significant progress has been made in advancing ZEVs, including: (a) expanded ZEV offerings in a variety of technology options (plug-in hybrid, battery, and fuel cell electric vehicles, collectively "electric-drive vehicles" or "ZEVs") and in nearly every light-duty vehicle segment, (b) an increase in the number of electric-drive models from 25 models today to more than 70 over the next five model years, (c) registrations of nearly 260,000 electric-drive vehicles in California and another nearly 70,000 in the Section 177 ZEV States, and (d) improvements in battery costs.[3,4]

Yet for all of this progress, the MY 2022-2025 ZEV requirements are extremely challenging and difficult to meet, even under the most optimistic market projections. Even though California has done more than any other state to build the infrastructure to support ZEVS, and even though California has offered the most enticing consumer incentives (such as cash rebates and HOV lane access), and even though California consumers are among the most willing to adopt new cutting-edge technology, ZEV sales are nowhere close to the goals set for MY 2022-2025. The situation is even more challenging in the Section 177 ZEV states, which have much less ZEV-friendly markets and where ZEV sales are currently a small fraction of California's.

All this demonstrates that the ZEV mandate must be about more than requiring manufacturers to make electric-drive vehicles available for sale. Consumer acceptance is the key. A sufficient number of customers must be willing to purchase a ZEV in order for manufacturers to meet the requirements. This represents the most significant challenge of the ZEV mandate, especially in the Northeast and Mid-Atlantic states, and should therefore be the focus of policymakers' efforts.

There are six staff recommendations regarding the ZEV regulation, and Global Automakers has the following comments and concerns about five of those recommendations as follows:

[2] ARB. *California's Advanced Clean Cars Midterm Review* at ES-1.
[3] ARB. *California's Advanced Clean Cars Midterm Review* at ES-3.
[4] IHS Global Vehicle Registration Data, Calendar Years 2011-2016.

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- ***The Stringency of the ZEV Requirements***

  The Staff Report recommends that the current stringency and credit structure of the ZEV program should be maintained through model year (MY) 2025. Global Automakers agrees that in light of the current state of the ZEV market, it would be inappropriate and counterproductive to increase the stringency of the ZEV requirements or change the structure of the program. The ambitious requirements through MY 2025 will be very challenging in California, and probably infeasible in the Section 177 States, which continue to substantially lag in market development, public awareness, and customer interest. In fact, it is not clear why this Midterm Review does not fully recognize the challenges ahead and recommend additional flexibilities to help smooth the compliance path.

- ***Treatment of Plug-In Hybrid-Electric Vehicles***

  The Staff Report recommends that the caps for maximum allowable plug-in hybrid-electric vehicles (PHEVs) that can meet the annual requirements should be not be changed. Global Automakers disagrees with this recommendation. Additional flexibility through raising the PHEV cap is necessary to help support compliance without impacting the overall goals of the ZEV program. An increase in the PHEV cap:

  - Will likely increase total volumes of electric-drive vehicles;
  - Increases manufacturer flexibility, while leaving program *stringency* untouched; and
  - Would aid OEMs in the difficult Northeastern ZEV states where severe weather can dramatically impact battery electric range and/or in ZEV states where infrastructure development to date has been insufficient.

- ***"Non-Regulatory Complementary Policies" to Build Markets***

  The Staff Report recommends that California continue efforts to accelerate and expand so-called "non-regulatory complementary policies" that have been identified as successful in building market demand and reducing barriers to ZEV adoption.

  Global Automakers agrees with this recommendation and suggests that it should indeed be a greater focus of all of the ZEV states' efforts. If states are serious about increasing the number of ZEVs sold, then they should devote their resources to building and supporting markets, and not focus on arbitrary numeric sales mandates. Electric and hydrogen infrastructure investment and development, ongoing incentives, codes and standards, and additional outreach efforts are needed through 2025. These efforts support market growth and ensure customers see electric-drive vehicles as viable options. These efforts are particularly important in the Section 177 States, which have not demonstrated nearly the level of commitment to market support as California.

- ***Flexibilities for the Section 177 ZEV States***

  Global Automakers appreciates the staff's recommendations to maintain the current Section 177 ZEV State flexibilities, but we disagree with the staff's conclusion that no additional flexibilities are needed.

  ARB has a responsibility to fully assess whether the stringent ZEV requirements for MY 2022-2025 are feasible in the Section 177 ZEV States, and we do not believe that ARB has sufficiently done so. There are fundamental differences between the markets in California and the Section 177 States that must be accounted for. These differences result from dissimilar consumer needs (ZEVs are simply more appealing to car-buyers in California than they are to car-buyers in Maine) and the relative lack of market building being undertaken outside of California. Had ARB assessed feasibility in the Section 177 ZEV States, it would have concluded that additional flexibilities are essential for manufacturers to meet the sales requirements in those states. Such flexibilities could include: (a) extending the pooling provision and interregional credit trading beyond MY 2021, and (b) adjustments to the requirements for states where market and infrastructure development are lagging.

- ***Post-2025 Considerations***

  The Staff Report recommends that the ZEV program for 2026 and subsequent model years should be strengthened and that changes may be needed to the credit provisions and regulatory structure to increase certainty on future ZEV volumes.

  Global Automakers does not believe that post-2025 considerations are within the scope of ARB's Midterm Review, which was intended to address only the current MY 2022-2025 standards. That said, Global Automakers disagrees with the assertion that ZEV volume certainty is needed, and we urge ARB not to use the Midterm Review as an opportunity to preselect a post-2025 regulatory vision.

Additional details about these positions are found in Section II, below.

Greenhouse Gas Program

Global Automakers and our members are committed to working with ARB, EPA, and NHTSA to advance the fundamental goals of the One National Program: a single, coordinated regulatory framework that achieves long-term improvements in fuel economy and GHG emissions and allows automakers to produce cars and trucks that meet the needs of their customers. But, we hold firm that a full and robust process is needed. The Midterm Review is an important piece of the One National Program, as it is intended to ensure that future regulations are achievable and cost-effective and further our collective environmental goals. Accordingly, the Midterm Review should be **science-**

based and **data-driven** and should **fully consider the impacts on consumer choice and affordability**.

Global Automakers and our member companies have stood by our commitment to, and have never wavered in our support for, the goals of the One National Program. Our member companies are working hard to reduce GHG emissions and petroleum consumption under this program and are investing billions in advanced technologies. Global Automakers has thus not asked that the federal GHG standards be pulled back, as some have suggested; to the contrary, we have asked for a return to a deliberative and coordinated Midterm Evaluation that relies on the up-to-date analysis of all relevant factors—such as market conditions, consumer preferences, technological advances, and changes in assumptions and predictions—and does not lock in a predetermined outcome.

We have, however, raised concerns throughout the federal review process, including the need for furthering alignment between the agencies' processes, improving upon the modeling, enhancing the consideration of consumer demand and affordability, and (more recently) restarting a process that was prematurely truncated. Global Automakers believes that these elements will provide a more robust analysis of the MY 2022-2025 GHG standards, and we look forward to continuing to coordinate with ARB, EPA, and NHTSA throughout the Midterm Evaluation process.

Global Automakers therefore offers the following comments on California's GHG program:

- Global Automakers strongly supports the recommendation in the Staff Report that California continue its participation in the National Program by maintaining the "deemed to comply" provision, which provides that compliance with EPA's GHG emission standards may (at an automaker's election) be deemed compliance with California's regulations. This aspect of California's GHG program was central to the auto industry's agreement to participate in the One National Program, and California has committed to maintaining that provision whatever the outcome of the federal Midterm Evaluation may be.

- Given that the federal Midterm Evaluation is still ongoing, Global Automakers recommends that ARB continue collaboration with EPA and NHTSA to address outstanding concerns regarding the substance of the GHG Midterm Review, such as consumer acceptance, modeling deficiencies, and how increased harmonization and programmatic flexibilities will ease compliance burdens while maintaining the goals of the One National Program.

- Global Automakers supports a strong, coordinated Midterm Evaluation of the GHG emission standards and as such believes that additional informational updates to the ARB Board will be necessary as the Evaluation progresses.

Additional details about these positions are found in the Section III, below.

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Particulate Matter Standards under the Low Emission Vehicle Program

The Low Emission Vehicle program (LEVIII) has provided significant emission reductions since its inception, and LEVIII is resulting in a greater than 75 percent reduction in vehicle emissions in MY 2015-2015 compared to LEVII. Automakers are implementing the LEVIII standards and at the same time are deploying technology and resources to significantly reduce GHG emissions and deploy increasing volumes of electric-drive vehicles under the ZEV program. As a result, light-duty vehicles represent a smaller and smaller portion of the emissions inventory in the state, with older vehicles contributing more than the newest LEVIII vehicles.

Global Automakers supports the need to improve air quality and suggests that ARB carefully consider the balance needed between implementation of three major regulatory programs simultaneously and the cost-benefits of these requirements. Regarding ARB's recommendations related to the PM standards:

- Global Automakers supports the staff recommendation to maintain the existing 1 milligram per mile (mg/mi) standard for particulate matter (PM) starting in MY 2025. Maintaining this flexibility allows for important lead time and necessary time to upgrade and modernize test facilities for testing at such low levels.

- Global Automakers recommends that the agency evaluate additional comprehensive PM emission standards further and balance the ability to minutely control PM further versus the larger and more costly goals of electrification of the fleet.

Additional details about these positions are found in Section IV, below.

Looking Ahead

Global Automakers and our members remain committed to the fundamental goals of California's Advanced Clean Car Program, and our members have made significant strides in improving motor vehicle fuel economy, reducing emissions, and commercializing advanced powertrain technologies. However, consumers are vital to the success of these regulatory programs, and it is critical that policymakers account for prevailing market realities as they set standards that will impact the types of vehicles that automakers will build and consumers will purchase for decades to come. This Midterm Review provides an opportunity to do just that. It must therefore be data-driven and objective and fully account for the needs of the customers—not just in California but also in the other states that have adopted California's regulatory programs. As Global Automakers and our members look ahead to 2025 and beyond, our collective task is to develop a smarter and more efficient approach to the goals ahead of us, including helping consumers manage the transition to vehicle electrification.

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II. THE ZEV PROGRAM

As noted in the Staff Report, over 25 electric-drive models are available in the U.S. today, and an expected 70 models will arrive in the next five model years. These offerings demonstrate a proven commitment by industry to bring ultra-low carbon technology to market. These models include plug-in hybrid electric vehicles (PHEV), battery-electric vehicles (BEV), range-extended battery-electric vehicles (BEVx), and fuel cell electric vehicles (FCEV) (collectively "electric-drive vehicles" or "ZEVs"). There are now electric-drive vehicles offered in nearly every vehicle segment. Cumulative sales in calendar years 2011 through 2016 have increased to over 325,000 in California and the nine Section 177 States.[5] Additionally, electric-drive technology has continued to improve while costs for components, including batteries and fuel cell stacks, have come down. Viewed in this way, ARB staff suggests that the ZEV program has been successful, stating:

> For the first time since the initial adoption of the regulation, the Board adopted increased ZEV credit requirements in 2012. This action, in concert with the development of strong comprehensive complementary policies to support infrastructure deployment and consumer awareness, led to the advancement of ZEV technology and growth in ZEV sales… Since the adoption of the 2018 through 2025 model year standards, manufacturers have been exceeding the annual requirements of the ZEV regulation and expanding the market nationwide by delivering ZEVs and PHEVs in states which have not adopted California's ZEV regulation.[6]

These achievements to date, however, do not guarantee that the program will be feasible in the years ahead. The purpose of the Midterm Review is to evaluate progress to-date with an eye toward feasibility of the requirements through 2025. The mandate through 2025 is very aggressive, and market growth will be extremely challenging. There remain many areas of uncertainty, especially those related to consumer acceptance and the progression of markets to support these new vehicles and the customers that buy them. Even today, consumers remain wary of adopting new technologies when it comes to their mobility preferences. Consumers' perceptions about the convenience, abundance, and overall availability of infrastructure also impact their purchasing decisions.

[5] Nearly 80 percent of the cumulative ZEV sales from 2011 through 2016 in the ZEV states were in California.
[6] ARB. *California's Advanced Clean Cars Midterm Review* at ES-6.

Market barriers and inadequate consumer demand are a current challenge and will increase the difficultly in meeting future ZEV requirements. The Staff Report recognizes this fact, and therefore describes how "non-regulatory complementary policies" (such as consumer incentives and expanded infrastructure) will be necessary to help drive the market. Inconsistent funding for these policies will hurt consumer acceptance, especially in the Section 177 ZEV States. There is currently a six-fold discrepancy in sales rates between California and the Northeast Section 177 ZEV states. Some of this may be accounted for by the mild weather and overall friendliness of consumers towards advanced technology in California. A large part of the difference may be attributed to broad, vertical integration of California ZEV policy throughout every major state agency, such as the California Energy Commission (CEC), the California Public Utilities Commission (CPUC), CalTrans, the Bureau of Automotive Repair, the Department of Transportation, the Department of Motor Vehicles, the Governor's Office of Business and Economic Development (GoBiz), etc. In addition, the California legislature has supported this program with significant incentives and policies, and the local jurisdictions have reduced barriers through updated code and standards and permitting processes. There is, however, no guarantee that these complementary policies—which ARB concedes are necessary for the success of the ZEV program—will materialize and be fully funded as we move forward. There is also nothing in the regulations that make manufacturer compliance conditional based on California's implementation of these policies.

Global Automakers is therefore disappointed that ARB has not taken this opportunity to address some of the barriers to ZEV market building through additional flexibilities and adjustments that could reduce compliance costs (and thus lower costs passed onto customers) and support additional successes under the ZEV program. In addition, Global Automakers is deeply concerned that ARB has not sufficiently reviewed feasibility in the other ZEV states, where more barriers and challenges exist compared to California. ARB's Midterm Review should not only identify challenges and barriers but offer solutions to address and overcome these barriers, including helping customers view electric-drive vehicles as viable options, and collectively enhance success toward our common goals – a cleaner, lower carbon path forward.

A. The Stringency of the ZEV Standards

The Staff Report recommends that the current stringency and the credit structure of the ZEV program should be maintained through MY 2025. Global Automakers agrees that it would be inappropriate to increase the ZEV requirements or alter the current structure of the program, given the current state of the ZEV market in the state. Indeed, the standards through MY 2025 will be extremely challenging in California, and even more so in the Section 177 ZEV States which continue to lag in market development and customer awareness and interest (further discussed in Part D, below).

The purpose of the Midterm Review is to evaluate the feasibility of the ZEV mandate, while considering new data, studies and analyses regarding ZEV technology and market factors. Feasibility, however,

should not be limited to assessing the capabilities and the costs of the relevant technologies; the state of the market and whether it can feasibly bear the number of ZEVs that must be sold should be a central consideration.[7]

In the past, feasibility of the mandate was directly tied to the availability of technologies in a variety of vehicle categories. With over 25 electric-drive vehicles offered in a variety of vehicle segments and types of ZEV technology, this barrier is diminishing. By ARB's own account, the ZEV program has been successful in its goal to push technology, with electric-drive vehicles sales and ZEV technology options increasing in the market:

> The 2012 Board action has resulted in over 215,000 ZEVs and PHEVs being placed in California over the last five years and an expansion from 25 models offered today to over 70 unique ZEV and PHEV models expected in the next five years. As a result of the vehicle technology advancements evident in the market, new minimum compliance scenarios were developed that project approximately 1.2 million cumulative sales of ZEVs and PHEVs by 2025 in California. While this revised compliance picture reflects a lower volume of vehicles than originally projected in 2012, the resultant improvements in ZEV and PHEV attributes, such as all-electric range and vehicle price, are expected to further broaden the appeal of these vehicles beyond the initial consumers and help achieve necessary future market expansion. Simply put, the market is seeing the introduction of better ZEVs.[8]

Another area related to feasibility of the standards raised by other stakeholders is the existence of credit banks. Under the ZEV program, manufacturers that over-comply with the early years of the program generate credits that can be banked for future use. These stakeholders have discussed the perceived abundance of credits as a reason to support an increase in program stringency or suggest feasibility is not an issue. Many stakeholders have claimed that an abundance of banked credits will ease the pathway to MY 2025 and reduce the volumes of ZEVs mandated; however, it is important to recognize that:

1. The ZEV program was created as a credit program to require early sales of advanced technologies and to "act as the focused technology forcing piece" of California's vehicle emissions program. By encouraging the early rollout of advanced technologies, the hope has been that the ZEV mandate would lead to commercialization and assist in supporting long term

[7] Global Automakers also does not agree with previous requests from other stakeholders to increase the stringency of the ZEV program through MY 2025. Any such change would require more lead time than is currently available, would disrupt product planning, and would further draw into question whether the current standards are feasible, especially in the Northeast ZEV states.

[8] ARB. *California's Advanced Clean Cars Midterm Review* at ES-7.

environmental goals. The recent effort by some advocates to focus on numbers of vehicles risks the program's focus on quality over quantity.

2. The credits were specifically designed to encourage technological advancements. As proof of this, one merely needs to examine the credit design structure that incentivizes range (a proxy for technology) and therefore provides a benefit for manufacturers to increase battery sizes in advance of economies of scale. ARB supports this point, saying:

> …the regulation has been achieving the goal of accelerating development of ZEV technology towards commercialization in California as demonstrated by the clear growth in the ZEV market, the introduction of more capable and longer range vehicles than originally projected, and earlier reduction in battery costs than anticipated.[9]

3. The credit program encourages manufacturers to put vehicles into the market even earlier than required through credit-based incentives. An example of this incentive is the inclusion of multipliers for beating the timelines of the requirements. This provision encourages manufacturers to bring vehicles to the market earlier than required, when adequate customer demand may not yet exist.

4. Credits are earned through vehicles that are produced and sold. They therefore represent the successful introduction of these vehicles and corresponding local environmental benefits.

5. Manufacturers bank and save credits. It is generally accepted that automakers typically want to maintain a year's worth of credits at any single time for compliance margin. As a result, manufacturers will not choose to use credits in place of selling actual electric-drive vehicles unless there is a product, technology or market failure – compliance margin is essentially insurance.

6. Credits allow for smoothing compliance pathways while expanding model offerings. Marginal credit holdings assure compliance despite an unforeseen technology failure, supply disruption, sudden recall, etc. Credits encourage manufacturer efforts to support uncertain consumer adoption of new, advanced technologies. Thus, credits allow for both regulatory and market stability.

The increased cost of ZEV technology continues to raise significant concerns with the ZEV mandate, even with earlier than expected reductions in battery costs. However, this cost impact is masked by two factors that artificially depress the purchase price of ZEVs. The first are federal and state financial incentives that can amount to up to $10,000 per vehicle. These incentives are a significant reason why

[9] ARB. *California's Advanced Clean Cars Midterm Review* at ES-7.

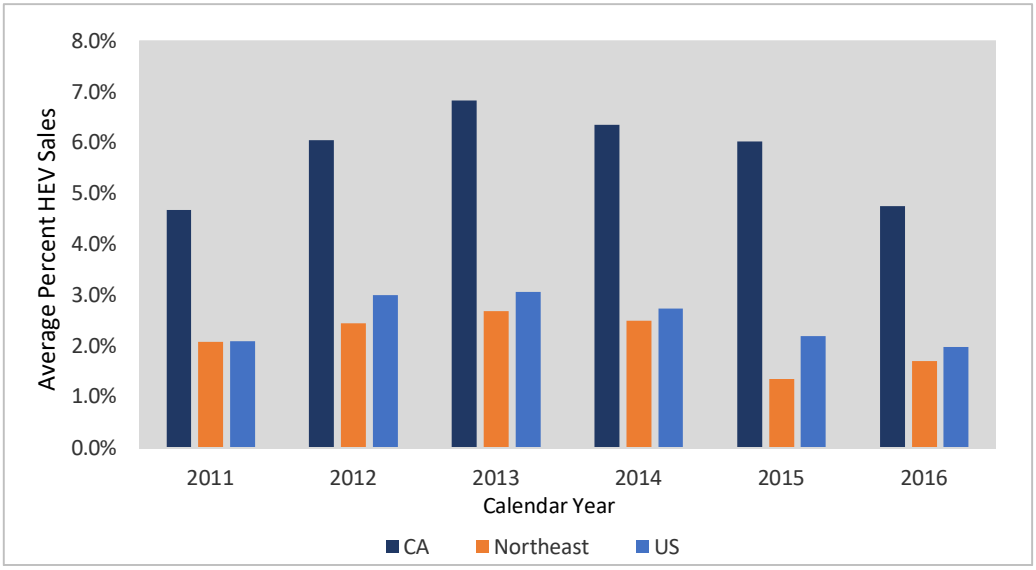
electric-drive vehicles are currently priced similarly to conventional vehicles. However, these incentives vary from state-to-state, and none of them are guaranteed to last forever. The second factor is the fact that automakers self-subsidize these vehicles, often selling them at a loss to attract consumers. The result is that some electric-drive vehicles are marketed at shockingly low prices (it has been widely reported that battery electric vehicles are available for less than a monthly cellphone bill in some areas). Yet despite all these efforts to keep the prices of electric-drive vehicles low, the market has stagnated. The lack of consumer demand is deeply troubling, and the lack of acknowledgement of this concern in the Midterm Review is disconcerting.

Nevertheless, the significant increase in the required ZEV sales volumes between now and 2025 cautions strongly against restricting the ability of manufacturers to bank and use credits for compliance. ARB's latest estimates are that, starting in MY 2018, the number of ZEVs should increase from around two percent of the market for compliance purposes to approximately eight percent of the market share by 2025[10] -- about a threefold increase over a short, seven-year period. This increase is both incredibly challenging and unprecedentedly high.

Hybrid vehicles, for example, have been available since 1999 and reached peak sales in calendar year 2013. The peak sales fell short of seven percent in California, did not exceed three percent in the Section 177 States (hybrid vehicles could meet a portion of the ZEV requirements in all ZEV states through MY 2017), and were about three percent on average in the United States (see Figure 1).[11] Since 2013, market share of new hybrid vehicles sales has steadily decreased across the nation. ARB offers no reason to conclude that the market for ZEVs will outpace the market for conventional hybrids.

[10] ARB. *California's Advanced Clean Cars Midterm Review* and *ZEV Calculator.* Around 73,000 electric-drive vehicles being sold in California in calendar year 2016 is equivalent to 3.6% of the total light-duty vehicles sold. Cumulatively, over 215,000 electric-drive vehicles have been sold in California since 2011. The new minimum compliance scenarios project approximately 1.2 million cumulative sales of ZEVs and PHEVs by 2025 in California. The estimated sales volume of electric-drive vehicles needed to meet the standards for model year 2025 is approximately 8% of total light-duty vehicle fleet sales. ARB's estimates are based on the "ZEV Calculator," but we believe additional information is needed regarding the assumptions underlying the "ZEV Calculator," including the possibility that the scenario selected for California is not the right scenario for the Northeast and better understanding of how the estimated compliance volumes relate to the market's starting point. If there are any differences from the ZEV Calculator's assumptions, the numbers of ZEVs needed would vary.
[11] IHS Global Vehicle Registration Data, Calendar Year 2013.

Figure 1: Hybrid Vehicle Sales as Percent of Total Light-Duty Vehicle Sales



Source: IHS Global Vehicle Registration Data, Calendar Years 2011-2016.

Additionally, the electric-drive vehicle market is still nascent. As noted in the ARB Midterm Review:

> It is widely recognized that the ZEV and PHEV market is still in the early stages of development… The current market has benefited from multiple purchase incentives that have substantially discounted ZEVs and PHEVs such that their prices are more aligned with those of conventional vehicles. But, between 2018 and 2025, these and other incentives are expected to phase out. While decreased reliance on incentives is essential for building a self-sustaining market, it is unclear what consumer response will be without purchase and other incentives (like high occupancy vehicle (HOV) lane access). Consumer awareness of ZEVs is still low and top motivations like saving money on fuel are less influential as gasoline prices remain low."[12]

Changes in incentives, lack of infrastructure development, and questionable customer acceptance will impact the ability to meet the mandate. While the mandate requires manufacturers to sell the vehicles, there are inadequate metrics to measure consumer acceptance, which is a necessity for long-term success. Since sales of these products thus far have been supported by ongoing incentives and infrastructure development in California, there is an ongoing reliance on incentives for continued growth in ZEV sales. Therefore, even more market-based efforts, including consumer incentives, ongoing HOV lane access, priority parking, etc., are needed to support and encourage customers to buy electric-drive vehicles.

[12] ARB. *California's Advanced Clean Cars Midterm Review* at ES-7.

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B. Treatment of Plug-In Hybrid-Electric Vehicles

The Staff Report recommends that the caps for plug-in hybrid-electric vehicles (PHEVs) should be not be changed.

Global Automakers disagrees with this recommendation. Additional flexibilities, such as raising the PHEV cap, are necessary to help support compliance. PHEVs can appeal to a broader population and serve as a transition to pure ZEV technology, and therefore should be allowed to play a larger role in compliance with annual ZEV requirements, as explained in the following.

1. The PHEV Cap Should Be Raised

PHEVs play a critical role in the continued move toward vehicle electrification. Global Automakers disagrees with the assertions made by certain advocates suggesting that PHEVs are inferior to other ZEV technologies. To the contrary, all ZEV technology options are necessary to support the transition to electric-drive vehicles. The cap on PHEVs should therefore be raised.

Determining the appropriate level of the PHEV cap should not be based on the expected emissions, which are regulated separately under the LEVIII and GHG programs. Rather, ARB's treatment of the PHEV cap should focus on the overall purpose of the ZEV mandate—*i.e.* to advance the commercialization of electric-drive vehicles. Raising the PHEV cap does not reduce the ZEV program's stringency and may provide more ZEVs on the road. This flexibility can also help manufacturers manage compliance cost. Global Automakers agrees with ARB's plans to continue to study PHEVs going forward, but Global Automakers also continues to believe that raising the PHEV cap in the interim will not adversely impact the ZEV program.

2. PHEVs Advance the Goals of Electric-Drive Technology Commercialization

The near-term marketability of PHEVs could give a significant boost to commercialization of all electric-drive technologies, which is in line with the overall goal of the ZEV program. PHEVs raise production levels and help lower the cost for numerous components common to all ZEVs, including electric motors, power control units, and batteries. Moreover, they provide their operators with important experiences, such as routine charging, that can all but eliminate such a concern during consideration of future BEVs. ARB's own scenario analysis points to the fact that PHEVs help consumers and manufacturers transition to pure ZEVs, stating that the standards "recognize PHEVs not only can help consumers and manufacturers transition to pure ZEVs but that they also can continue to be a significant share of the vehicle market."[13]

[13] ARB. *California's Advanced Clean Cars Midterm Review* at ES-8.

PHEVs therefore provide customers an additional technology option and support customers who drive longer distances, have range anxiety, and/or do not have convenient or consistent access to charging locations in the following ways:

- PHEV technology is not range-limited, so a network of fast-charging stations is not a limitation for customers considering buying or leasing a PHEV. For areas of the country struggling to find resources to accommodate near-term infrastructure build-out, PHEVs' ability to sidestep the chicken-and-egg conundrum offers meaningful value.

- It is important to note that PHEVs make much lower demand for new infrastructure in the near term. For customers unable or unwilling to invest in Level 2 charging, PHEVs can cover the vast majority of driving needs with existing Level 1 charging.

- For customers in areas of the country subject to cold weather, such as the Northeast and Mid-Atlantic states, PHEVs offer advanced technology benefits without the drawback of cold weather-based range limitations.

3. Credit Trading Is Not a Substitute for Raising the PHEV Cap

ARB seems to assert that other flexibilities, such as credit banking and trading, are sufficient to negate the need for a higher PHEV cap. ARB states:

> Further, banking and trading provisions already exist that would allow manufacturers with excess PHEV generated credits to bank them for future use or perhaps trade with other manufacturers that have not fully utilized their PHEV credit allowances. Combined, this provides sufficient flexibility in the current regulatory structure as the ZEV market is developing to determine the role PHEVs will ultimately play.[14]

Global Automakers strongly rejects this assertion. Simply put, one flexibility is not a substitute for another. It seems staff believes that an automaker should take the risk to bank credits of one type assuming that credits from another automaker will be available to comply with its obligation in another type of credit. Additionally, staff believes that if automakers want to exceed their PHEV compliance cap and bank credits for future years, the ZEV program is sufficiently "flexible" to account for this. Automakers are in different competitive positions with respect to technology maturation, their own customer base, and the ability to meet the ZEV regulations. Advanced technology is "advanced" specifically because it is not yet commercially available at known prices for known performance and quality standards. Some automakers may

[14] ARB. *California's Advanced Clean Cars Midterm Review* at ES-54 to 55.

indeed be able to take advantage of near-term advantages, while others may not. As Global Automakers stated earlier, the ZEV standards are challenging, and each year that the standards increase, over compliance will be a luxury rather than a norm. ARB should be more considerate of the challenges many automakers face and, accordingly, be as flexible as possible.

In summary, given the important role PHEVs play in the market transition to electric-drive vehicles and their appeal to a wider segment of the car-buying public, PHEVs should play a greater role in the ZEV program and the PHEV cap should be raised.

C. "Non-Regulatory Complementary Policies" to Help Build Markets

The Staff Report recommends that California continue efforts to accelerate and expand so-called "non-regulatory complementary policies" that have been identified as successful in building market demand and removing remaining barriers to ZEV adoption.

Global Automakers strongly agrees with this recommendation. Electric and hydrogen infrastructure investment and development, ongoing incentives, and additional outreach efforts are needed through 2025. These efforts support market growth and ensure customers see electric-drive vehicles as viable options. These efforts are particularly important in the Section 177 ZEV States which have not shown the same commitment to market support as California.

1. Market Building Efforts Are Necessary to Spur Consumer Demand

The viability and success of the ZEV program (and GHG program) ultimately depend on consumers. While California's ZEV mandate *obligates manufacturers* to produce vehicles that meet the regulatory requirements and deliver them for sale, they *do not obligate consumers to purchase* those vehicles. Although the number of vehicles that consumers can choose from continues to increase, fleet transformation to electric-drive vehicles requires sufficient, and growing, consumer demand. If a substantial number of customers choose not to buy the mandated vehicles – for reasons of cost, features, drivability, perceived durability issues or infrastructure availability – the standards will not be achieved. Appendix B of ARB's Midterm Review considers consumer acceptance of ZEVs, but this area needs additional attention.[15]

The Staff Report correctly observes that incentives and other complementary policies pay a significant role in spurring demand for electric-drive vehicles:

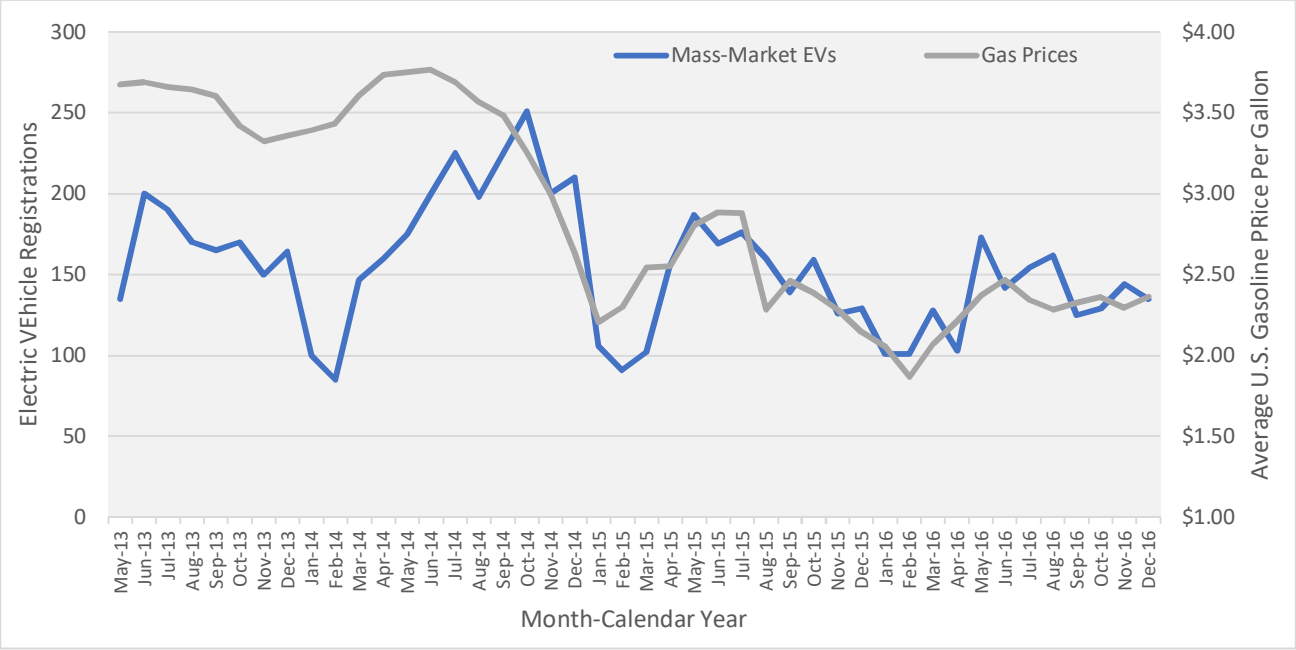
[15] This topic has been widely studied. For instance, the "Collaboration for ZEV Success" group, a coalition of automakers, Section 177 ZEV states, Global Automakers, the Alliance, and NESCAUM, developed a background document on studies and sources looking consumer acceptance and awareness to provide. This list included over 100 sources.

> While decreased reliance on incentives is essential for building a self-sustaining market, it is unclear what consumer response will be without purchase and other incentives (like high occupancy vehicle (HOV) lane access).[16]

Incentives, as discussed further below, are important because they draw attention to the technology and help to balance the disparity in electric-drive technology costs compared to conventional vehicles.

But even with current incentives, electric-drive vehicle sales have been stagnant the previous two years. The data also shows that demand for electric-drive vehicles is closely correlated with gasoline prices. Figure 2 shows a strong correlation between sales of "mass-market EVs" compared to gasoline prices.[17]

Figure 2: Gasoline Prices and Battery Electric Vehicle Sales Generally Track Each Other



Sources: IHS Global Vehicle Registration Data, Calendar Year 2013-2016.
Energy Information Administration, http://www.eia.gov/dnav/pet/pet_pri_gnd_dcus_nus_m.htm.

In addition, consumers continue to have concerns with the driving range of electric-drive vehicles, time to charge, towing/hauling capacity, and perceptions about acceleration/passing capability, dependability, and reliability.[18] Although some customer perceptions may change with newer battery packs and different model options, changing entrenched consumer perceptions of vehicles will not occur

[16] ARB. *California's Advanced Clean Cars Midterm Review* at ES-7.
[17] The Tesla Model S is not included in this analysis as it is a luxury vehicle, and its sales do not track with gasoline prices.
[18] ARB. *California's Advanced Clean Cars Midterm Review* at B-46.

overnight. ARB's own research in the Midterm Review shows there is still a long way to go for consumers to consider electric-drive vehicles in the same category as "traditional" vehicles. ARB notes that "among all these current drivers, more than 90% report they would replace their current vehicle with another ZEV or PHEV and about half would be willing to pay additionally for greater all-electric range."[19] While this data supports good consumer acceptance once a customer has owned an electric-drive vehicle, it does not address whether new customers will be attracted to the vehicles. This suggests that there will be additional challenges expanding sales beyond the "early adopters" captured by today's sales percentage of electric-drive vehicles and into the mainstream. In addition to continuing to evaluate consumer perceptions going forward, ongoing consumer educational and outreach campaigns and ride-and-drives will be needed to assist in exposing customers to the benefits of electric-drive vehicles.

2. The Need for Market Building Efforts Is Widely Recognized

The ARB Midterm Review recognizes that increasing the number of electric-drive vehicles on the road entails much more than automakers designing and building vehicles with the required electric-drive technologies; rather, there must be "market pull" on the demand side. ARB states:

> Irrespective of any regulatory action, appropriate complementary policies will need to be in place to support the expansion of the ZEV market as the market share will need, at a minimum, to approximately triple in the next nine years. ARB and other stakeholders will need to accelerate and expand non-regulatory and complementary actions that have been identified as successful to continue to enhance market demand for ZEVs and remove the remaining barriers to ZEV adoption. Examples of such policies include consumer rebates and tax credits, carpool lane access, availability of public charging infrastructure, parking incentives, and others.[20]

This conclusion is supported by numerous studies showing that incentives, infrastructure development, and consumer outreach are essential to supporting sales of electric vehicles. For instance:

- The Conservation Law Foundation et. al. found:

[19] ARB. *California's Advanced Clean Cars Midterm Review* at B-3.

[20] ARB. *California's Advanced Clean Cars Midterm Review* at ES-8. Elsewhere, however, the Midterm Review implies that meeting the ZEV mandate is merely a matter of automakers producing vehicles. On the first page of the Midterm Review, ARB states that the ZEV mandate "acts as the focused technology-forcing piece of the ACC program by requiring manufacturers to ***produce*** increasing numbers of pure ZEVs . . . in the 2018 through 2025 model years." (emphasis added) *Id.* at ES-1. This, of course, is not entirely accurate. The ZEV mandate requires more than that manufacturers "produce" the required numbers of ZEV. The regulations also require that the vehicles be delivered for sale to a market that is willing to purchase them. Without a robust market on the *demand* side, the ZEV program will fail.

> …much more is needed in each state in the near-term, and all stakeholders need to act boldly. Automakers and auto dealers often say that states need to create more EV consumer incentives. Government agencies and consumers often say that automakers and auto dealers need to do more to advertise EVs and make them available in more states and at more dealerships. Many question why utilities are not taking a more active role in helping consumers switch to EVs. This report makes clear that we need an all-hands-on-deck effort from government, utilities, automakers, and auto dealers, and it lays out a full range of priority actions and policies to accelerate EV adoption.[21]

- ICCT concludes:

> The research reveals several key findings that could be helpful in understanding electric vehicle policy actions and deployment patterns…The top electric-vehicle adoption cities tended to have some combination of more electric vehicle promotion action, greater charging infrastructure per capita, greater consumer incentives, and greater model availability.[22]
>
> Policies that reduce effective electric vehicle ownership costs are priming the early market. The leading metropolitan electric vehicle markets tend to have consumer subsidies, public charging infrastructure, and other incentives that make electric vehicles more attractive to prospective buyers. In addition to the dramatic fuel-saving benefits, policy support is helping to defray the upfront cost differential for the new advanced technology as well as alleviate consumer information and convenience issues…Gaps in awareness, education, information, and model availability are inhibiting growth in the electric vehicle market. Although policies to reduce operating costs of electric vehicles matter, they only partly explain trends in the early market…Extending electric vehicle policy incentives through 2020 is likely to be critical to sustaining market growth.[23]

[21] Conservation Law Foundation et. al. "Charging Up: The Role of States, Utilities and the Auto Industry in Dramatically Accelerating Electric Vehicle Adoption in Northeast and Mid-Atlantic States," October 2015. Pg. 1. https://www.sierraclub.org/sites/www.sierraclub.org/files/uploads-wysiwig/ChargingUp_DIGITAL_ElectricVehicleReport_Oct2015_0.pdf.

[22] ICCT. "Assessment of leading electric vehicle promotion activities in United States cities," July 2015. Pg. v.

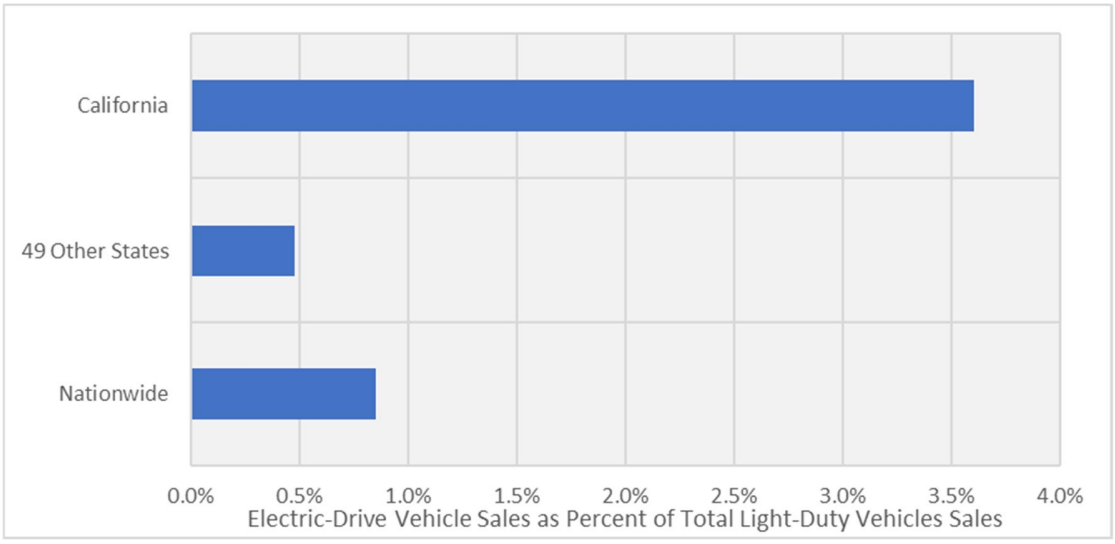
[23] ICCT. "Supporting the Electric Vehicle Market in U.S. Cities," October 2015. Pg. 9. http://www.theicct.org/sites/default/files/publications/SupportEVsUScities_201510.pdf.

- The National Academy of Sciences states "[o]verall, the experience worldwide demonstrates that substantial financial incentives are effective at motivating consumers to adopt PEVs."[24]

- Independent research conducted by Global Automakers and the Alliance of Automobile manufacturers showed that differences between (extreme) weather, infrastructure availability, and customer knowledge contributed to lower sales in the eastern ZEV states.[25]

To its credit, California has been at the forefront of these activities, committing year-after-year resources and funding, and the results can be seen in the fact that the ZEV market share in California (3.6 percent) is four times the national average (0.9 percent) (see Figure 3 below). When California is removed from the national average, the level of electric-drive vehicle sales drop from 0.9 percent nationwide to 0.5 percent for the 49 states, as shown in Figures 3 and 4 below, because over 50 percent of the electric-drive vehicle sales occur in California.[26] As we discuss below, progress in the Section 177 ZEV States, however, has been lagging, in part because their commitment to complementary, non-regulatory actions has not been at the same level as California's, started much later than California's, and has been a lower priority in these states' legislatures.

Figure 3: 2016 Average Electric-Drive Vehicle Sales



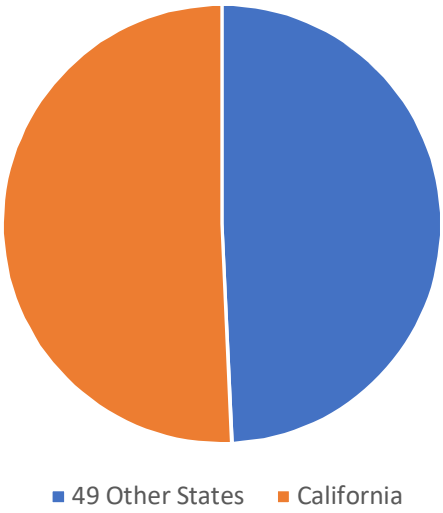
Source: IHS Global Vehicle Registrations, Calendar Year 2016.

[24] National Academy of Sciences. "Overcoming Barriers to Deployment of Plug-in Electric Vehicles," 2015. Pg. 164. https://www.nap.edu/catalog/21725/overcoming-barriers-to-deployment-of-plug-in-electric-vehicles.

[25] Independent consumer research conducted by the Mellman Group for Global Automakers and the Alliance of Automobile Manufacturers. July 2016. Presented to ARB and the ZEV states.

[26] IHS Global Vehicle Registration Data, Calendar Year 2016.

Figure 4: U.S. Electric-Drive Vehicles Sales



Source: IHS Global Vehicle Registrations, Calendar Year 2016.

3. Consumer Incentives Play an Important Role

Incentives (financial, such as rebates, tax credits, and free refueling, and non-financial, e.g. HOV lane access and priority parking) have been consistently shown to assist with customer acceptance of electric-drive vehicles. Incentives create attention surrounding certain technologies and help reduce the higher costs of new technology compared to conventional petroleum-fueled vehicles. For instance, California's single-occupant access to the HOV lane for electric-drive vehicles has served as an important market driver for these vehicles in the state. These points are supported by an ICCT study that states, "the top electric-vehicle adoption cities tended to have some combination of more electric vehicle promotion action, greater charging infrastructure per capita, greater consumer incentives, and greater model availability."[27]

The predictable and sustainable continuation of strong vehicle incentives will be critical to the continued development and strength of electric-drive market, particularly at a time when low gasoline prices do not encourage customers to consider alternative fuels.

When the Advanced Clean Car regulations were adopted in 2012, California was the only state with a consistently-funded, existing ZEV rebate program. California's Clean Vehicle Rebate Project (CVRP) was "designed to promote the purchase of battery electric, plug-in hybrid electric, and fuel cell electric

[27] ICCT. "Assessment of leading electric vehicle promotion activities in United States cities," July 2015. Page 7 of PDF. http://www.theicct.org/sites/default/files/publications/ICCT_EV-promotion-US-cities_20150729.pdf.

vehicles."[28] Since then, California has issued more than $380 million in rebates, helping put more than 220,000 ZEVs on the road since 2010[29] (at a price of approximately $34 per ton of GHG reduced[30]). As illustrated by the success of the CVRP, fostering consumer familiarity with electric-drive vehicles and growing the demand for these technologies will require maintaining financial incentives for ZEVs, until the ZEV market is self-sustainable.[31]

Failing to ensure funding for the CVRP, or moving to discontinue the program entirely, would have a significant impact on ZEV sales. Georgia provides an excellent case-study concerning the importance of consumer vehicle incentives. At one point in time, Georgia offered one of the highest consumer purchase incentives ($5,000) for battery electric vehicles (BEVs). With this incentive, in 2014, the state of Georgia had the highest number of BEV sales as a percent of the new light-duty vehicle sales, exceeding the longtime leader, the state of California (see Table 1).

Table 1: Battery Electric Vehicle Registration Data
(As Percent of Total Vehicles Registrations)

	2014	2015		2016
Georgia	2.1%	2.0% (January-June)	0.4% (July-December)	0.3%
Total U.S.	0.4%	0.4%		0.4%
California	1.6%	1.7%		1.9%

Source: IHS Global Vehicle Registrations, Calendar Years 2014-2016.

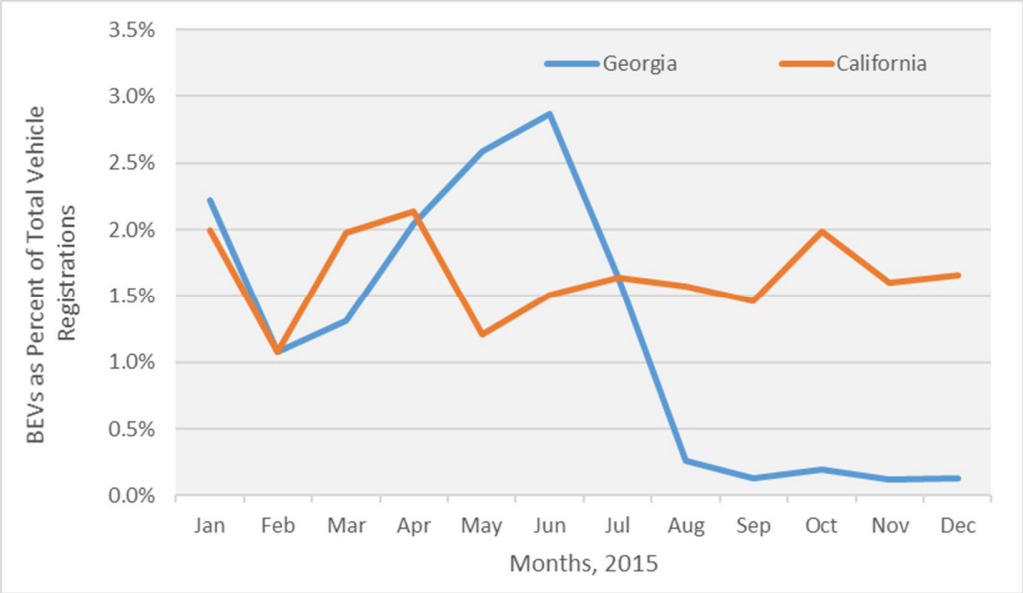
While Georgia's incentive was offered, Georgia's sales exceeded California's. At its peak, in the month of June 2015, Georgia's sales of BEVs reached 2.9 percent (see Figure 5). This data suggests that if Georgia's incentive had remained, Georgia would have become the nation's leading market for BEVs.

When Georgia enacted a law, effective June 30, 2015, that eliminated the tax credit and implemented a $200 registration fee (the highest in the nation), newly registered BEVs fell from their peak June sales of 2.9 percent to 0.4 percent, on average, in July through December 2015. Georgia's BEV sales did not bounce back in 2016 and now remain on par with the national average of 0.4 percent. This data

[28] ARB. Clean Vehicle Rebate Project. https://www.arb.ca.gov/msprog/aqip/cvrp.htm.
[29] California Clean Vehicle Rebate Project, https://cleanvehiclerebate.org/eng.
[30] Roughly estimated at $1,727 per vehicle ($380 million per 220,000 vehicles), and each vehicle eliminates approximately 50 tons of lifetime GHG (200,000 miles/vehicle x 250 grams per mile of CO_2 saved).
[31] In addition to state-based incentives, the federal government provides up to $7,500 in tax credits for plug-in hybrid and battery electric vehicles. This credit is available for up to 200,000 vehicles sold per manufacturer and then ends. Once this credit ends, it is unclear how the market will react in response. In addition, there is federal credit for fuel cell electric vehicles as well, but this credit, which was extended in 2015, ended December 31, 2016.

demonstrates the influential impact financial incentives can have on electric-drive vehicle sales, and the detrimental impact removing an incentive can have the market.

Figure 5: 2015 Battery Electric Vehicle Registrations in Georgia



Source: IHS Global Vehicle Registration Data, Calendar Year 2015, State of Georgia.

4. Electric Charging and Hydrogen Infrastructure are Key to the Increased Commercialization of Electric-Drive Vehicles

Infrastructure remains a critical piece in developing healthy and sustainable electric-drive vehicle markets. Home charging has often been touted as a benefit for plug-in electric vehicle drivers. It is, but home charging is not sufficient alone. Customers need to be able to understand and see how electric-drive vehicles fit into their individual lives and can be used to travel beyond daily commutes if these vehicles are going to become mainstream. The National Academy of Sciences recognizes that "[p]ublic charging infrastructure has the potential to provide range confidence and extend the range for limited-range BEV drivers, to allow long-distance travel for long-range BEV drivers, and to increase eVMT and the value proposition for PHEV drivers."[32] In addition, fuel cell electric vehicles offer a fast-refueling, long-range option compared to plug-in electric vehicles, but the availability of infrastructure is severely limiting today.

[32] National Academy of Sciences. "Overcoming Barriers to Deployment of Plug-in Electric Vehicles," 2015. Pg. 121. https://www.nap.edu/catalog/21725/overcoming-barriers-to-deployment-of-plug-in-electric-vehicles.

The National Academy of Sciences has suggested that "[m]ore research and market experience are needed to determine how much public infrastructure is needed and where it should be sited to promote PEV deployment and to encourage PEV owners to optimize vehicle usage."[33] Global Automakers supports this finding and believes that ARB's Midterm Review fails to fully assess the role infrastructure in California and the Section 177 ZEV States. Global Automakers believes that more work is needed in this area and has often recommended to the individual states that they undertake third-party studies on the amount of infrastructure needed to support growing markets of electric-drive vehicles.

California contracted with the National Renewable Energy Laboratory in 2014 to evaluate future electric charging infrastructure needs. Separately, the Fuel Cell Partnership, in coordination with ARB and the California Energy Commission, has developed a roadmap for development of hydrogen stations in California. While we appreciate California's efforts to understand the state's needs and proactively look at how to increase infrastructure, Global Automakers is concerned that California's infrastructure development is not keeping pace with California's desired ZEV volumes. For electric charging stations, the NREL study concludes that 46,500 Level 2 and 1,550 DCFC stations are needed by 2020 to support 1 million PEVs (assuming high public access to mitigate the infrastructure issues associated with multi-unit dwellings to maximize the consumer base), and yet today the state is only at 9,329 Level 2 and 995 DCFC.[34]

Regarding hydrogen stations in California, new stations are coming online at a slow and steady pace, but there is still not adequate coverage. California has been a leader in this area and has appropriately designated funding to help build a network of stations. But, the operative word is slow. The process to find, site, permit, and build stations is arduous, despite many efforts to streamline it. Global Automakers suggests that ARB continue hydrogen infrastructure build-out efforts, while simultaneously looking for opportunities to encourage faster development of hydrogen infrastructure in the state.

D. Flexibilities for the Section 177 ZEV States

The Staff Report recommends that the current flexibilities for the Section 177 ZEV States should be maintained. Global Automakers does not believe that current flexibilities are sufficient. Additional flexibilities are critical. The ZEV market in the Section 177 States is fundamentally different from that in California. This can be seen in the raw numbers of ZEV sales, as well as in those states' non-regulatory

[33] National Academy of Sciences. "Overcoming Barriers to Deployment of Plug-in Electric Vehicles," 2015. Pg. 121. https://www.nap.edu/catalog/21725/overcoming-barriers-to-deployment-of-plug-in-electric-vehicles.

[34] National Renewable Energy Laboratory. *California Statewide Plug-In Electric Vehicle Infrastructure Assessment*, May 2014. http://www.nrel.gov/docs/fy15osti/60729.pdf.

complementary policies—which ARB has conceded are a prerequisite to the sort of market building that is necessary to comply with the mandate.[35]

One of the fundamental goals of the Midterm Review is to assess program feasibility through MY 2025, and that means assessing the feasibility in *all* ZEV states, not just California where the market is far ahead of the other ZEV states. Any objective analysis of the ZEV program in the Section 177 States would raise significant concerns about whether the mandate is feasible in those states. ARB has not done enough to assess feasibility in the Northeast and Mid-Atlantic states. California created the ZEV program and sets the requirements, and thus California has the duty to ensure a robust and data-driven assessment of the ZEV program in each ZEV state.

1. ZEV Sales in the Section 177 ZEV States Lag Significantly Behind California

California and the nine ZEV states combined represent about 30 percent of the total light-duty vehicle sales in the United States. Electric-drive vehicles are being sold in these nine ZEV states today, but their market growth is well below California's (see Table 2 and Figure 6, below). There is currently a six-fold discrepancy in sales rates between California and the Northeast Section 177 ZEV states and nearly a two-fold discrepancy in sales rates between California and Oregon. As noted previously, Global Automakers believes that the ZEV requirements through MY 2025 in California will be challenging. It will be even more challenging, if not infeasible, to meet the requirements through MY 2025 in any market with a lower sales rate than California.

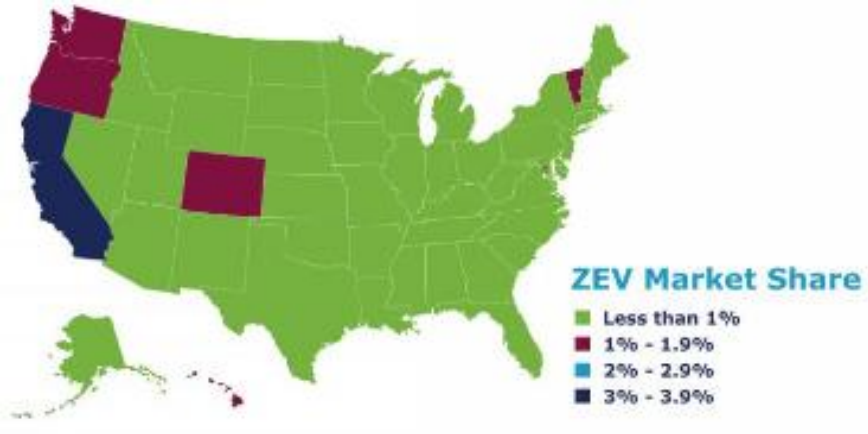
Table 2: Electric-Drive Vehicle Data

States	ZEV Registrations (rounded to thousands)		
	2016	2016 Percent of Total Vehicle Registrations	Cumulative 2011-2016
California	73,000	3.6%	255,000
Oregon	3,000	2.0%	9,000
Eight Northeast and Mid-Atlantic States	16,000	0.6%	55,000

Source: IHS Global Vehicle Registration, Calendar Years 2011-2016.

[35] For more information on state electric-drive vehicles sales, incentives and infrastructure, please visit www.drivingZEV.com.

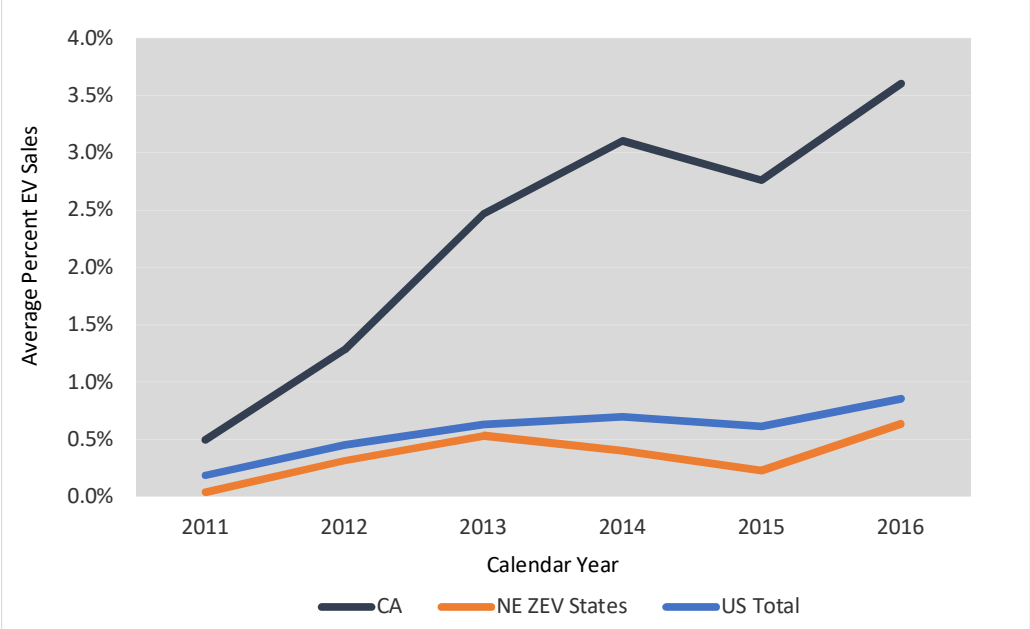
Figure 6: New Vehicle Sales of Electric-Drive Vehicles as Percent of Total Light-Duty Vehicle Sales, Calendar Year 2016



Source: www.drivingZEV.com

The problem is particularly acute in the Northeast and Mid-Atlantic states, which are still well behind the national average for ZEV sales (0.6 percent compared to 0.9 percent nationwide), (see Figure 7, below).

Figure 7: Electric-Drive Vehicle Sales as a Percent of Total Light-Duty Vehicle Sales



Source: IHS Global Vehicle Registration Data, Calendar Years 2011-2016

As this data shows, automakers have a much steeper hill to climb to reach the required ZEV sales in the Northeast than they do in California. Between now and 2025, ZEV sales must increase from 0.6 percent to roughly eight percent, ***a thirteen-fold increase.***[36] The Staff Report contains no concrete discussion of whether such a significant increase is even possible over this time period.

2. There are Fundamental Differences Between the California Market and the Northeast Market

Fundamental differences exist between the California market and the Northeast market that impact the market demand for ZEVs. These differences include incentives, codes and standards, public infrastructure, weather, HOV lane access, housing stock (single family homes vs. multi-unit dwellings), parking availability, driving behaviors, and so on. The exclusion of such assessments from the Midterm Review – a report whose *fundamental purpose* is to examine these very types of issues – raises serious questions about the objectivity of ARB's findings. Rather than addressing industry concerns and providing reasoned responses to these issues, ARB appears to ignore these points and, instead, suggests that regional variation in sales trends "may be the result of uneven exposure to ZEVs and PHEVs at dealerships…or through auto manufacturer advertising."[37] While those issues may play a part in regional sales variation (and are, in fact, addressed elsewhere in these comments), we strongly urge ARB to consider the entire complement of possible factors, including those lying beyond industry control.

One major difference between the two areas, for example, is climate. The Northeast and Mid-Atlantic states typically have a colder winter, on average, than California. ARB and the California Energy Commission sponsored a limited study from California vehicles and trips, collected through a GPS-based study to assess consumers' actual usage of plug-in electric vehicles in California. Similar data for vehicle use and charging was provided for the Northeast and Mid-Atlantic states as well.[38] This data provides more insight into how electric-drive vehicle drivers behave in cold weather. Specifically, it shows that "the efficiency of a BEV varies with ambient temperature due to battery efficiency and cabin climate control."[39] As ARB notes, "76% of electric-drive vehicle owners in the colder climate of Boulder, Colorado were dissatisfied by the electric range of their vehicle."[40] This cold-weather data

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[36] IHS Global Vehicle Registration Data, Calendar Years 2011-2016. This increase is even greater if we consider the goal under the ZEV MOU that states build the market to support 3.3 million vehicles by 2025; that means supporting approximately 2.3M electric-drive vehicles in the Northeast and Mid-Atlantic states alone, an astronomical increase from today's cumulative sales of less than 60,000 in the Northeast and Mid-Atlantic states since 2011.

[37] ARB. *California's Advanced Clean Cars Midterm Review* at B-1.

[38] Yuksel, T. and Michalek, J. "Effects of Regional Temperature on Electric Vehicle Efficiency, Range and Emissions in the United States." *Environ. Sci. Technol.*, 2015, 49(4), pp 3974-3980.

[39] *Ibid.*

[40] Farhar, 2012, Farhar, B.C., D. Maksimovic, and A. Peters. The Human Dimensions of Plug-in Hybrid Electric Vehicles in Boulder. 2012 11/28/2012; Available from: https://cleanenergyaction.files.wordpress.com/2012/11/plug-inhybrid-electric-vehicle-study.pdf.

should further be used to assess fundamental differences between drivers and vehicle miles traveled compared to California.

This data demonstrates that Northeastern drivers, who drive electric-drive vehicles, have reduced vehicle miles traveled in the colder months compared to the same months in California. This data shows that the vehicles have a decrease in range: cold climate regions also encounter days with substantial reduction in EV range. The average range on the coldest day of the year drops from 70 miles on the Pacific coast to less than 45 miles in comparable colder climates.[41] These differences in climate have real effects on consumers' willingness to purchase electric-drive vehicles as dependability throughout the year is not necessarily consistent. This is just one example of where ARB's analysis for the other ZEV states is incomplete.

3. The Relative Lack of Market Building Efforts in the Section 177 States is a Contributing Factor in Their Lagging Sales

Another significant difference between California and the Northeast and Mid-Atlantic Section 177 ZEV States is the commitment to the sorts of non-regulatory complementary policies that ARB agrees are key to growing the market.

a. Consumer Incentives

Since 2012, seven of the nine other ZEV states have implemented rebates, tax credits, and/or sales tax exemption to help support ZEV sales. However, the amounts of these financial incentives vary, and the funding for them has been minimal. Consumer purchase incentives are important to help grow the market and increase customer interest in electric-drive vehicles. But, in markets still in their infancy, additional consumer incentives will be needed. It is also necessary to ensure consistent funding going forward so that a program does not inadvertently cease, which would likely result in a significant drop in sales, such as what happened in Georgia (see Figure 5, above). For instance, here are four examples:

- Connecticut was one of the first states to launch a rebate program in the Northeast. This rebate program includes consumer incentives, up to $3,000, which is the highest available rebate among the ZEV states. Connecticut's program also includes one of the first dealer-based incentives to encourage dealers to sell ZEVs. Since the inception of the rebate, Connecticut's ZEV sales, as a percent of total ZEV sales, has seen minimal growth. Moreover, funding has come through various settlement efforts, meaning that the rebate program has been refunded in small increments each time the rebate funding nears depletion. Thus far, Connecticut has been able to find funds as needed but is at constant risk of running out of funds. Therefore, while Connecticut continues to provide a rebate,

[41] Yuksel, T. and Michalek, J. "Effects of Regional Temperature on Electric Vehicle Efficiency, Range and Emissions in the United States." *Environ. Sci. Technol.*, 2015, 49(4), pp 3974-3980.

Connecticut would benefit from a consistent source of funding to ensure the program does not fun out of funds and that the state needs additional incentives, beyond the rebate, to help push the market forward.

- Rhode Island first funded its rebate program with $500,000, but now is at risk of running out of funds, the legislature is considering a bill to add $250,000 per year. This amount is less than the original $500,000 funds (nearly used within one year) and does not show any intent to want to help increase electric-drive vehicles sales.

- Maryland has an excise tax credit that expires at the end of 2017. The legislature is pro-actively considering a bill to extend this tax credit, but if action is not completed before year end, the state will lose its incentive.

- New York announced intent to issue a rebate program in 2016, following enactment of a law that included the consumer rebate. But, nearly a year later, the program has not yet launched. New York has, however, recently announced plans to finally start the consumer rebate program by April 2017.[42] We understand that there were problems finding funds to support the rebate, despite the state quickly funding municipal rebates adopted in the same law as the consumer rebate program. Sales of electric-drive vehicles in New York are at one of the lowest percent of total sales among the Northeast and Mid-Atlantic states, despite being the largest vehicle market overall of these states. This demonstrates that New York is badly in need of incentives, as well as other measures to kick off their sales.

While industry and states recognize the necessity of incentives for electric-drive vehicles, states are starting to look at diminishing funds for roads and pointing to electric-drive vehicles. The issue is that battery electric vehicles do not need petroleum, and therefore are not paying gas taxes that are typically used to fund roadways. While we understand the challenge among states to fund their roads, the issue is far more complex than battery electric vehicles. For instance, nationwide sales of battery electric vehicles are lower than one half of one percent (0.4%) of total light-duty vehicles sales. It is hard to believe that such small volumes are impacting roadway funding that significantly. What the states are failing to recognize is that industry has been increasing the fuel efficiency of petroleum-fueled vehicles – the other 99.6% of vehicle sales – under the federal and California greenhouse gas and fuel economy regulations. While these regulations are providing significant environmental benefits, they also mean less fuel is used, and therefore less taxes are collected from sales of gasoline.

[42] Associated Press News. "New York to launch electric vehicle rebate." March 4, 2017. http://wxxinews.org/post/new-york-launch-electric-vehicle-rebate.

This year, twelve states are proposing increasing vehicle registration fees for electric-drive vehicles to close the gap in diminishing gas taxes;[43] this is in addition to ten states that already have these fees.[44,45] First and foremost, these registration fees are insufficient to close the gap. But, more importantly, Global Automakers is concerned that the fees will act as a barrier to electric-drive vehicle adoption at a time when we are devoting all efforts to creating incentives. By adding a fee, particularly in states where market acceptance is already lower than other states (and where the mandate exists), it will impact the payback of the vehicles and dissuade customers from considering the vehicles in the first place. The National Academy of Sciences recognizes this challenge, stating that "[p]erceptions of fairness and equity are important factors to consider in PEV tax policies, even though the actual revenue impact of PEV taxation is negligible in the short run and *likely to remain minimal over the next decade*."[46] [emphasis added] The National Academy of Sciences further supports that "Federal and state governments should adopt a PEV innovation policy where PEVs remain free from special roadway or registration surcharges for a limited time to encourage their adoption."[47] There will be a fine balance between additional fees that help the states and that discourage consumers.

b. Charging and Refueling Infrastructure

While California has long been a leader in supporting infrastructure for electric-drive vehicles, Global Automakers is greatly concerned that the other ZEV states are falling behind. Representatives for the states have touted that the Section 177 ZEV States are well ahead of California in terms of infrastructure compared to where California started in 2011 (see Figure 8 below). This point is true, but it is not a sufficient argument when these states should be prepared to support a similar volume of vehicles compared to California, as a percent of sales, starting in MY 2018. In fact, the travel provision (as discussed below in more detail) was originally put in place in partial recognition that the Section 177 States were behind on infrastructure and could not support growing volumes of electric-drive vehicles. During the time between 2012 and 2018, the ZEV states should have increased their infrastructure significantly in preparation for MY 2018.

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[43] Walton, Robert. "Report: Six states propose new electric vehicle fees," *Utility Dive*. February 23, 2017. http://www.utilitydive.com/news/report-six-states-propose-new-electric-vehicle-fees/436767/.

[44] Von Kaenel, Camille. "A dozen states target clean cars for 'crazy' new fees," *EENews*. March 3, 2017. http://www.eenews.net/climatewire/2017/03/03/stories/1060050867 (subscription based).

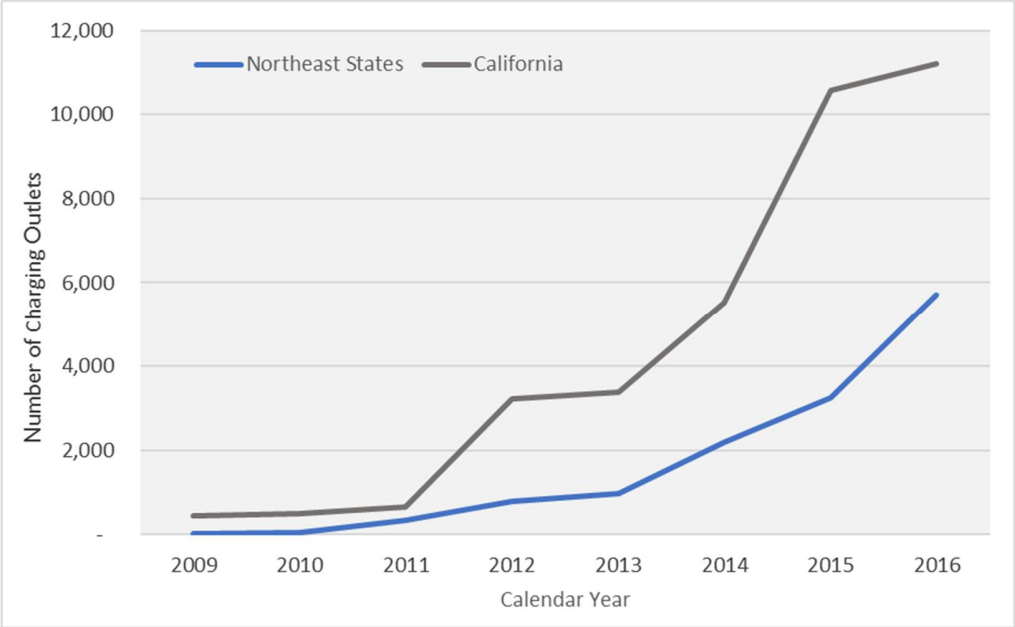
[45] The ten states with additional registration fees for electric-drive vehicles are Colorado: $50 PEV; Georgia: $300 commercial/$200 non-commercial PEV; Idaho: $150 PEV/$100 HEV; Michigan: $100 EV ($200 for heavy-duty) and PHEV plus $30 gasoline tax; hybrid owners pay a $30 surcharge plus $17 in gas taxes; Missouri: $75 PEV; Nebraska: $75 PEV; North Carolina: $100 EV; Virginia: $64 EV; Washington: $100/$150 if the car can run for 30 miles on battery power; and Wyoming: $50 PEV.

[46] National Academy of Sciences. "Overcoming Barriers to Deployment of Plug-in Electric Vehicles," 2015. Pg. 99. https://www.nap.edu/catalog/21725/overcoming-barriers-to-deployment-of-plug-in-electric-vehicles.

[47] National Academy of Sciences. "Overcoming Barriers to Deployment of Plug-in Electric Vehicles," 2015. Pg. 101. https://www.nap.edu/catalog/21725/overcoming-barriers-to-deployment-of-plug-in-electric-vehicles.

In addition, while the ZEV requirements are the same as California in MY 2018, the reality is that, in aggregate, the Section 177 States represent a total vehicle volume of approximately 1.5 times the size of California's market. Therefore, the amount of infrastructure should also exceed California's by approximately 1.5 times.

Figure 8 Public and Private (Non-Residential) Electric Vehicle Charging Outlets



Source: http://www.afdc.energy.gov/.

Finally, the ZEV program is supposed to commercialize a variety of electric-drive technologies. Manufacturers are trying a variety of options, including three fuel cell electric vehicles currently available in California. Manufacturers are working hand in hand with California to rollout these vehicles alongside hydrogen refueling stations, but they do not have the same support or opportunity in the Northeast and Mid-Atlantic states. Global Automakers and our members have long urged the Northeast and Mid-Atlantic states to begin to plan for hydrogen, including considering locations for stations and identifying funds to invest in building hydrogen refueling stations.[48] Yet, this action has not occurred. Global Automakers believes that all electric-drive technologies must play a role going forward and that hydrogen can offer unique benefits in all regions. Global Automakers and our members will be increasing efforts in the year ahead to educate, collaborate and identify opportunities

[48] The travel provision, which ends in MY 2018 for battery electric vehicles, will continue indefinitely for fuel cell electric vehicles (FCEVs). The travel provision is important because it recognizes that there is no infrastructure to support FCEVs in the Section 177 ZEV States. It is, however, not an excuse for the states to delay or ignore hydrogen-fueled vehicles as an option for the ZEV program. All ZEV technologies will be needed going forward, and work needs to start now to help support the expansion of the market for FCEVs.

in the east to develop hydrogen infrastructure. For instance, Global Automakers and our members will be beginning efforts with the Section 177 ZEV States to develop an investment plan for the installation of hydrogen stations, starting with discussions at the upcoming New York Auto Show in April 2017.

Any assessment of infrastructure development in the Section 177 ZEV States should entail more than a "check-the-box" activity. Instead, an in-depth study should be undertaken that evaluates the amount of electric and hydrogen infrastructure needed, where infrastructure currently exists and is lacking, how current infrastructure is used, customer awareness surrounding infrastructure, and the amount of funding devoted to developing infrastructure.

c. Automakers Have Been Actively Engaged in The Section 177 ZEV States to Support Necessary Complementary Policies

Recognizing the need for complementary policies to help build a market for ZEVs, eight of the ten ZEV states announced a ZEV Memorandum of Understanding in 2013, an effort intended to support the mandate and build markets to support 3.3 million electric-drive vehicles by 2025.[49] However, the promise of the MOU is not being fulfilled, in part because the Section 177 States are not committing the necessary resources.

Global Automakers has been actively engaged with the Section 177 States, primarily in the Northeast and Mid-Atlantic states, and other stakeholders promoting the necessary complementary policies to build up electric-drive vehicle markets. One such effort is through the "Collaboration for ZEV Success," which consists of automakers, the eight ZEV MOU states, Northeast States for Coordinated Air Use Management (NESCAUM), Global Automakers and the Auto Alliance. This group is the one of the first instances where multiple states and auto industry have come together to evaluate and address barriers together, and to identify joint means to address those barriers. It has led to the support of numerous state ride-and-drive events; tours of electric-drive vehicles on display at the New York International Auto Show specifically for the Northeast and Mid-Atlantic states due to the proximity of the show to the region;[50] an investigation of consumer attitudes about electric-drive technology; and a joint project to develop the underpinnings of a campaign to increase ZEV awareness.

[49] It is highly problematic that two ZEV states (New Jersey and Maine) did not sign onto the MOU. These two states are showing no interest in supporting their ZEV markets, and yet they maintain the same standards as California and the other seven ZEV states. Manufacturers are responsible for the mandate in those states regardless of the state of the market or the state's activities to support their market. ARB should evaluate regulatory options to adjust requirements per state activities. If the market is greatly limited because the state won't do its part, it does not seem equitable to hold the manufacturers accountable as well. Further, New Jersey has the second largest overall vehicle market of the Northeast and Mid-Atlantic States. Even with pooling, it will not be feasible to shift the mandated volumes to smaller markets, or even New York, purely based on the stringency of the requirements post-2021.

[50] Global Automakers, in coordination with the Auto Alliance, also provide tours at the Los Angeles and Detroit Auto Shows for other regulators. These shows typically cover all vehicle technologies, including fuel efficient, safety and electric-drive

In addition, Global Automakers has been actively working with the state legislatures in the Northeast and Mid-Atlantic states to support bills and other efforts that would strengthen infrastructure investment for electric charging and hydrogen refueling, financial incentives, and other non-financial market support mechanisms for electric-drive vehicles. These efforts are in support of and aligned with the states' overall goals to expand efforts to build markets per the 2013 ZEV MOU. In addition to the efforts made by individual member companies, Global Automakers has implemented a holistic and multi-pronged approach to engaging with the ZEV states on the necessary elements for building and growing sustainable electric-drive vehicle markets. These strategies and tactics have been designed to both complement traditional lobbying and engage policymakers outside of those efforts. Additionally, these consistent efforts have contributed to a steady drum beat of support for incentives and infrastructure in ZEV states, as well as nationwide.

During the last two years alone, Global Automakers has:

- Met with legislative and committee leadership, as well as the Governor's offices in Connecticut, Maryland, New Jersey, New York, and Vermont;
- Presented written and oral testimony on electric vehicle legislation;
- Briefed committees of jurisdiction as issue experts on zero emission vehicle mandate;
- Coordinated efforts with other stakeholders;
- Hosted New Jersey legislators to see and learn about electric vehicles at the New York International Auto Show in New York City;[51]
- Engaged lawmakers, stakeholders, and media via social media channels (see Figure 9 below);
- Issued press releases and blogs regarding importance of state investment;[52]
- Created DrivingZev.com, an on-line tool to educate policymakers on ZEV technologies and the importance of building markets; and
- Co-funded a ZEV consumer awareness study with NESCAUM and the Alliance. The results from the study are being used to develop a consumer awareness campaign.

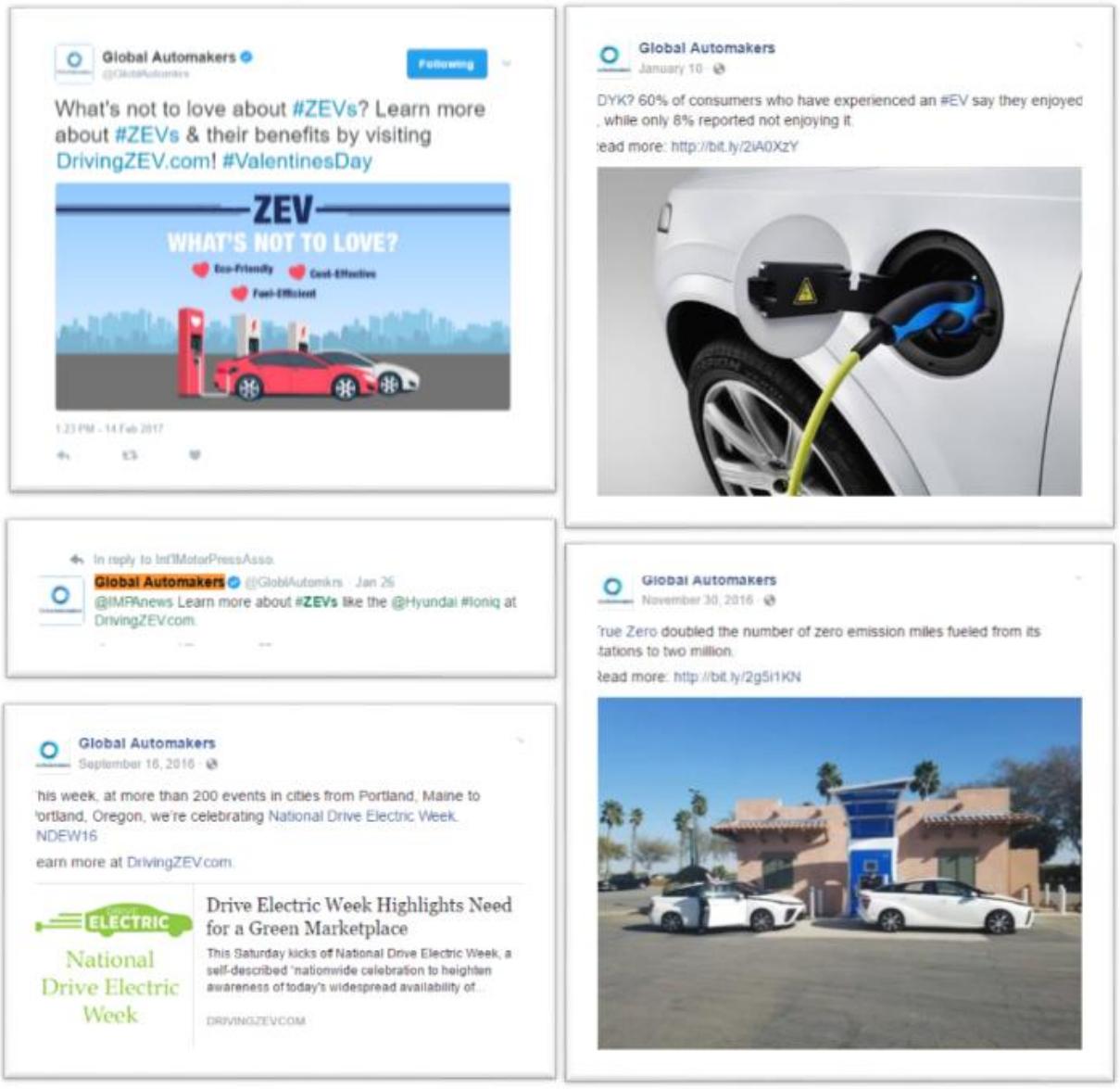
vehicles. New York's Auto Show was added to support states with lower travel budgets and to provide a more convenient travel location for states in the Northeast and Mid-Atlantic.

[51] New York legislators have also been invited but due to overlap with the New York state budget process, the timing has not worked out to host them at the New York International Auto Show

[52] Examples from Global Automakers:

- Global Automakers DrivingZEV Blog, http://www.drivingzev.com/blog. This blog includes monthly ZEV market reports and blogs on state-specific efforts.
- "Connecticut Continued Funding of ZEV Rebates Critical – But Increased Investment is Needed to Reach State Mandated Goals," November 18, 2018. http://www.globalautomakers.org/media/press-release/connecticut-continued-funding-of-zev-rebates-critical-%E2%80%93-but-increased-investment-is.
- Bozzella, John. "The Big Apple is Crisp on ZEVs," *The Automotive: Driving the Conversation on the Evolution of the Auto Industry*. April 8, 2016.

Figure 9: Examples of Global Automakers' Social Media Promoting ZEVs



Sources: https://www.facebook.com/GlobalAutomakers/ and https://twitter.com/GlobIAutomkrs.

A good example of these efforts coming together is in Massachusetts, where legislation was introduced during the 2015-2016 legislative session. Early in the process Global Automakers met with members of Governor Baker's senior staff to brief them on the issue of limited state investment. In parallel, Global Automakers also worked with bill sponsors to introduce legislation, testified at committee hearings, and organized a support letter that included environmental organizations and business representatives.

In conjunction with member companies and the Committee on Global Warming, Global Automakers held a public briefing for policymakers and stakeholders alike, followed by a series of legislative meetings. But as previously mentioned, our efforts are only part of the story. Two member companies are also active members of the Commonwealth's ZEV Commission, and Global Automakers has submitted multiple letters to the Commission, who has been tasked with releasing a ZEV Action Plan. During the course of the session, no opportunity was missed to increase awareness and advocate for needed investment.

Our efforts have produced some results. Massachusetts Governor Baker has committed $12 million for consumer rebates provided by the MOR-EV program, and Connecticut Governor Dannel Malloy has invested in that state's consumer rebate program – CHEAPR. New York State has created an incentive program, though that has gone unfunded for about a year; New York has finally announced efforts to start its consumer rebate program in April 2017, more than a year after the law creating the rebate program was enacted.

While the above actions are to be commended, the truth is much more needs to be done. The commitment from the Northeast and Mid-Atlantic states has been slow and not lived up to the commitments in the ZEV MOU, especially in the largest markets. New York, the largest vehicle market in the East, has implemented very few incentives to date and been delayed in building promised infrastructure. In New Jersey, legislation that created a study committee reached the desk of Governor Chris Christie and was subsequently vetoed. Little other legislation in New Jersey has gained momentum since. And in Connecticut, legislation to allow electric vehicles to access HOV lanes failed to pass. Additionally, many manufacturers have spent several years working with specific states to remove barriers that prevent the sale of fuel cell electric vehicles, such as prohibited use on bridges or in tunnels, placarding issues and the ability to meter refueling. Despite ongoing efforts to address these issues, these barriers persist, and the states have shown little willingness to help support changes in support of fuel cell electric vehicles.

Global Automakers' efforts have supplemented those by our individual members. Our member companies have also worked with the state legislatures, but their efforts go far beyond a "lobbying" approach. At the end of the day, they must ensure they can sell their vehicles. Thus, in addition to designing and producing electric-drive vehicles, our companies have invested time, effort, and resources in:

- Training and educating their dealers
- Offering vehicle incentive pricing
- Providing specialty knowledge experts to help support dealers
- Training service providers and emergency responders about new electric-drive technologies

- Advertising[53] and marketing the vehicles at local and national levels
- Participating in state-based coalitions and working with other key stakeholders
- Working in partnership with utilities, fuel providers, governments, etc.
- Working with states to address ongoing market barriers and update codes and standards to support electric-drive technologies
- Working with state legislatures to encourage state investment in incentives and in electric and hydrogen infrastructure
- Investment of millions of dollars in electric vehicle charging infrastructure development.
- Providing free public charging to customers
- Forming partnerships with utilities, charging station providers, fuel providers and others that help support customers' abilities to refuel/recharge their vehicles at reasonable costs and at convenient locations
- Outreach to local governments, schools, and businesses to provide electric-drive vehicle education and training
- Assisting and participating in workplace infrastructure efforts
- Investment in hydrogen partnership and hydrogen refueling infrastructure efforts
- Providing vehicles at ride-and-drives

These actions demonstrate the tangible commitment of Global Automakers and our members to building supportive and ultimately sustainable markets for electric-drive vehicles. Yet despite all of the above efforts—by member companies, by trade associations, and through collaborate efforts with the states and NESCAUM—the Northeast and Mid-Atlantic states have not made sufficient commitments to the policies that will actually move the market for ZEVs, and the lack of results show.

4. The Lagging Sales and Lack of Market Development in the Section 177 States Support the Need for Additional Flexibilities

Despite these efforts to help build the market for ZEVs in the Northeast and Mid-Atlantic, it is clear that those states are far behind California in terms of sales, which is a reflection of both the fundamental market differences and the relative lack of commitment to the necessary complementary policies. Global Automakers therefore supports the Staff Report's recommendation that the current flexibilities for the Section 177 ZEV states should be maintained, but we strongly disagree with staff's conclusion that no additional flexibilities are needed. Specifically, we recommend the following:

- Extending the whole pooling provision. Staff extols the virtues of pooling, without acknowledging that pooling is scheduled to end after MY 2021. This flexibility is critical to all automakers and was "purchased" at great cost by the manufacturers in the 2012 regulatory

[53] For example, here are a list of advertisement from national Superbowl coverage over the years: http://www.superbowlcommercials.co/?s=electric+vehicles.

process; automakers agreed to smaller, early requirements in the ZEV states in exchange for pooling. Pooling, along with the provision that allows credits to be traded between pooled regions, should be extended through 2025 (or indefinitely) without any additional requirements being placed on automakers.

Pooling currently consists of three regions: California, West (Oregon only), and East (eight states: Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Rhode Island, and Vermont). Pooling allows manufacturers to shift sales of electric-drive vehicles within a region (for instance between the eight eastern ZEV states) to compensate for states with lagging markets, insufficient incentives, inadequate infrastructure, etc., while still ensuring that actual vehicles are sold within the region. Pooling, therefore, was as much a flexibility for the eastern states, which were given additional time to meet their commitments under the ZEV MOU to support and build markets for electric-drive vehicles. The pooling provision allows the industry to respond to more favorable market conditions among the Northeast and Mid-Atlantic states (incentives and infrastructure investments for example) while also increasing the total number of electric-drive vehicles on the road. This flexibility provides states some cover while they continue efforts to build market support.

Pooling is necessary. While the Northeast and Mid-Atlantic states have collectively increased activity and investment in electric-drive vehicles, these efforts are inconsistent across the states.[54] More importantly, two states, New Jersey and Maine, did not commit to the MOU. These two states have not been actively engaged in developing their markets and have shown no indication that they plan to support the mandate in the near term. This lack of commitment by the states impacts ZEV sales, which are approximately 0.45 percent and 0.65 percent in Maine and New Jersey, respectively.[55] This is a significant problem; when pooling ends in MY 2021, there will be the same ZEV requirement in those two states as the others, but with a severely limited and unsupported market for the vehicles. As Global Automakers suggests below, pooling alone will not be sufficient to deal with states that have not done their part. Regardless, every state should be investing heavily in its electric-drive vehicle market to support the electric-drive vehicles required by the mandate. In the event a state's market falls behind, pooling provides leeway in the interim for both the state and the automakers as they strive to meet the mandate in each region.

[54] At the same time, it is important to note that states should not view pooling as a means to shirk responsibility from funding incentives and infrastructure development. With each year that the ZEV requirements get more stringent, it will become harder and more difficult to shift any significant volumes of electric-drive vehicles within the region. Global Automakers has, and continues, to work with the individual states to raise recognition with state legislators that state support is critical to the any state's commitment to implement California's ZEV program.
[55] IHS Global Vehicle Registrations, Calendar Year 2016.

Global Automakers also suggests that ARB consider whether it would be appropriate to include California and Oregon together as the West region going forward; these two markets have had the greatest early successes with electric-drive vehicle sales and have been leaders in developing their markets through a variety of incentives, infrastructure development, customer outreach programs, tourism-based programs, etc. This would allow manufacturers to shift sales between California and Oregon more seamlessly and without incurring the existing penalty put on credits traded between regions. Alternatively, ARB should assess whether the credit trading penalty is still necessary, and consider allowing unrestricted credit trading between all of the ZEV states.

- Adjustment to the sales volume requirements in the Section 177 States. The ZEV standards should recognize the fact that the ZEV market in the Section 177 States is fundamentally different than in California (on account of consumer needs/preferences and lack of complementary policies). Just because manufacturers can sell a certain percentage of ZEVs in California does not mean they can in Maine, a state that has done nothing to support or build out its ZEV market. In addition, neither Maine nor New Jersey are participating in the ZEV MOU. These two states show no interest in supporting their ZEV markets, and yet they have the same standards as California and the other seven ZEV states. Further, New Jersey has the second largest overall vehicle market of the Northeast and Mid-Atlantic States. Even with pooling, it will not be feasible to shift the mandated volumes to smaller markets, or even New York, purely based on the stringency of the requirements post-2021. Manufacturers are responsible for complying with the mandate in those states regardless of the state of the market or the state's activities to support their market. ARB should evaluate regulatory options to adjust requirements to account for the state's activities. If the market is greatly limited because the state won't do its part, it does not seem equitable to hold the manufacturers accountable. ARB should therefore implement adjustments to the standards outside of California. These adjustments should consider the status of market development in all states and at the same time allow for continued progress in increasing states' ZEV volumes. States that are not doing their part to build electric-drive vehicle markets are a drag on the ZEV program, requiring extra resources to artificially create demand in unsupported environments.

5. Arguments that have been Advanced in Opposition to Greater Flexibilities in the Section 177 States Are Without Merit

There have been several criticisms that other stakeholders have used to explain the discrepancy in sales in the Section 177 ZEV States and to argue against greater flexibility. These include arguments that the "travel provision" has hampered sales and that manufacturers have failed to make vehicles available and market them. We do not agree that any of these issues are causing the discrepancy in sales between California and the eastern ZEV states. The issue is far more complex, and each of these criticisms ignores the most obvious underlying conditions: consumers do not yet view electric-drive

vehicles as viable options in the eastern region. We believe it is necessary to refute these points further, as follows.

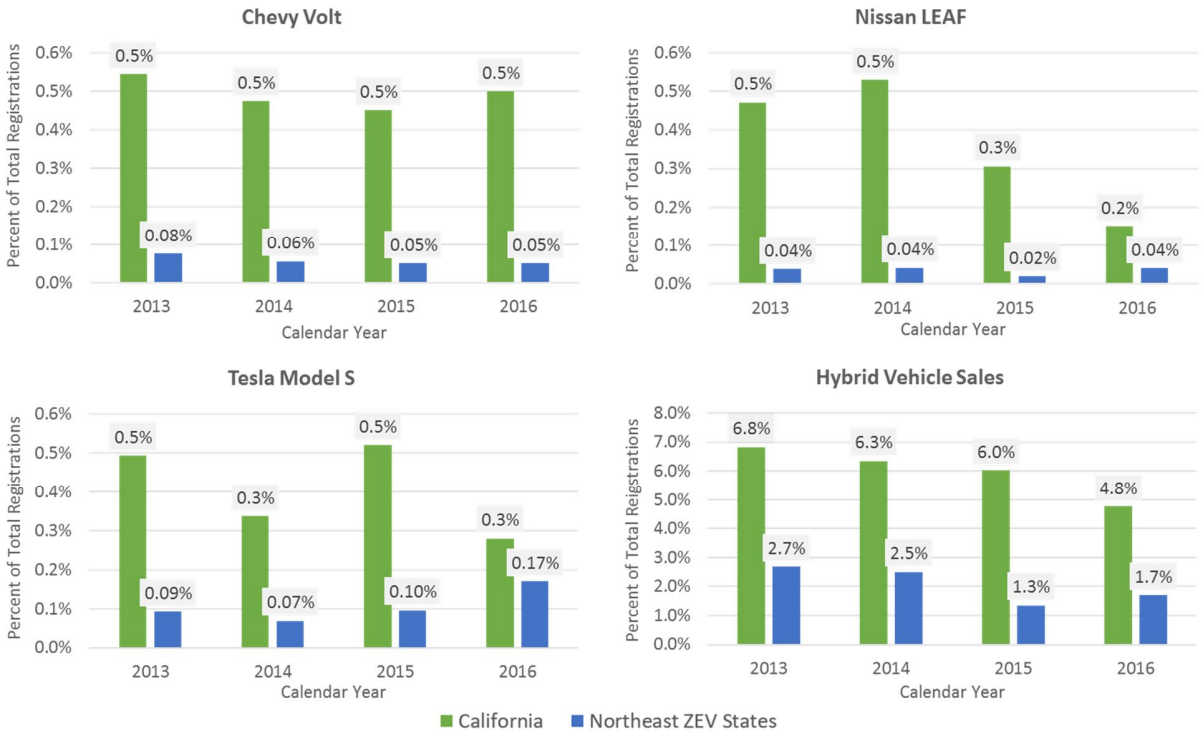
- The travel provision does not restrict sales. ARB first implemented the travel provision in recognition that the market for plug-in electric technologies (plug-in hybrids and battery electric vehicles) were nascent and fully dependent on the existence of charging infrastructure. While California was devoting resources and efforts to developing a charging network, the other ZEV states had not done so. As a result, it was recognized that any market for plug-in electric vehicles was not viable in the Section 177 ZEV States. Therefore, California adopted the "travel provision," which allowed a ZEV placed in California or a Section 177 State to be counted as being sold in each of the ZEV states.

  In the 2012 Advanced Clean Car rulemaking, ARB decided to end the travel provision following MY 2017 on advisement of the Section 177 States. These states felt the travel provision was preventing manufacturers from offering electric-drive vehicles in their states. This provision was removed on the promise of a growing market, and that the states would develop adequate infrastructure, as "codified" by the 2013 ZEV MOU.

  We disagree that the travel provision has restricted sales in the Section 177 ZEV States. The travel provision was a flexibility that allowed manufacturers to sell vehicles *in any market* and earn credit *in every market*, proportionately. This means that, from a regulatory standpoint, all things being equal, automakers are just as likely to market BEVs in Section 177 ZEV States as they are in California. Had the states made a similar effort, or even a fraction of the effort, that California has made, sales results might have been much higher. Additionally, since 2012 there has been no travel provision for PHEVs, requiring obligated automakers to market PHEVs in these states.

  To further demonstrate that the travel provision is not the culprit, one should assess the sale of three ZEVs that have all along been available nationwide since being introduced in the market (see Figure 10): Nissan LEAF, Chevrolet Volt, and Tesla Model S (hybrid vehicles are added, for context, as a fourth example). Despite ARB's assertion in the Midterm Review that hybrids have not acted as transition to electric-drive vehicles, hybrids were counted as part of the ZEV mandate since 2003. Moreover, hybrids were never subject to the travel provision, because they do not require any special infrastructure. Thus, the travel provision would not have prevented manufacturers from selling hybrids in the Section 177 ZEV States. Yet, the data shows a similar discrepancy between sales in the Northeast and Mid-Atlantic states versus California—not only for the three nationally available ZEV models, but for hybrids as well. Further, assuming favorable market conditions, customer demand, and adequate infrastructure availability, there is nothing inherent in the travel provision that would have prevented manufacturers from selling ZEVs in the Northeast and Mid-Atlantic states.

Figure 10: Consumer Purchasing Differences between California and Northeast and Mid-Atlantic ZEV States for Nationally-Available Vehicles



Source: IHS Global Vehicle Registration Data, Calendar Years 2013-2016.

- Electric-drive vehicle availability is inherently tied to customer demand, and not the other way around. In 2016, the Union of Concerned Scientists (UCS) released a report, "Electrifying the Vehicle Market, Evaluating Automaker Leaders and Laggards in the United States."[56] This report cited data from a joint consumer survey project with the Consumers Union that there is sufficient consumer demand for electric-drive vehicles. The report then reviewed automakers' efforts, categorizing them as "leaders" and "laggards," ostensibly to explain why sales have not kept pace in markets outside of California. One of the primary factors UCS pointed to was the availability of electric-drive vehicles within various markets. While we appreciate UCS is trying to help identify issues that can be addressed to increase sales in the future, UCS has misrepresented the consumer survey data. UCS has also conflated cause and effect – the availability of electric-drive vehicles varies *because* customer demand varies.

[56] Reichmuth, David and Anair, Don. Union of Concerned Scientists. "Electrifying the Vehicle Market, Evaluating Automaker Leaders and Laggards in the United States," August 2016. http://www.ucsusa.org/sites/default/files/attach/2016/08/Electrifying-Vehicle-Market-full-report.pdf.

UCS states in their new report that "[i]n a 2016 survey of drivers in California and the Northeast and Mid-Atlantic states, conducted by UCS and Consumers Union, drivers expressed a strong interest in EVs. Most drivers would consider an EV for their next car."[57] UCS has mischaracterized the data; this is not what the survey data shows. The actual percentage of people in the survey who would consider an electric-drive vehicle for their next vehicle is much lower. In one part of the survey, it is 15 percent in the Northeast and Mid-Atlantic states versus 26 percent in California (30 percent in the Northeast and Mid-Atlantic states and 46 percent in California if you include people who want an electric-drive vehicle "someday" but are not considering it for their next vehicle) (survey Q7). In another part of the survey, the survey question was asked in a different manner, and the results for consumers open to considering an electric-drive vehicle for their next car was approximately 21-32 percent in the Northeast and Mid-Atlantic states and 39-50 percent in California (survey questions Q4-Q6). These percentages do not support the claim that "most drivers would consider an EV for their next car." The majority of those "interested" people, however, either said they "hope to have an EV someday" or said specifically they "may be interested but today's vehicles don't meet their needs." This is a weak indication of interest, and other studies have shown that "interest" is decidedly different from actual purchasing intent and behavior.[58]

UCS also implemented a flawed methodology for classifying vehicles as "available" for sales within states. First, UCS only counts a given model as being "for sale" if there were 20 of that model purchased in that state in 2015. Application of this threshold creates problems, especially in markets with small overall light-duty vehicle sales. Many of the states in which UCS showed zero models for sale, for example, had dozens of registrations in 2015. The reason was that several different models were sold. For example, Arkansas had 76 electric-drive vehicles registered in 2015,[59] but UCS's map says there were none for sale. This means that no single model sold more than 20 units in Arkansas; but the number of registrations in the state suggest

[57] *Ibid,* pg. 3.

[58] For example:

- J. Anwyl. "Consumers Union needs to rethink their survey methodology," July 1, 2016. https://www.linkedin.com/pulse/consumers-union-needs-rethink-survey-methodology-jeremy-anwyl?articleId=8684004692532162171
- Taub, E.A. Start-Stop Technology Is Spreading (Like It or Not). New York Times. April 7, 2016. http://www.nytimes.com/2016/04/08/automobiles/wheels/start-stop-technology-is-coming-to-cars-like-it-or-not.html.
- Muro, M. "Auto Slowdown Signals Narrowing of Advanced-Sector Growth." *Brookings* (August 2016). https://www.brookings.edu/blog/the-avenue/2016/08/22/auto-slowdown-signals-narrowing-of-advanced-sector-growth/.
- T. Gayer and K. Viscusi, "Overriding consumer preferences with energy regulations," *J Regul Econ* (2013) 43:248–264. https://law.vanderbilt.edu/files/archive/318_Overriding-Consumer-Preferences-with-Energy-Regulations.pdf
- T. Turrentine et al., "Fuel Economy: What Drives Consumer Choice?" *Access* 31:04 (2007).

[59] IHS Global Vehicle Registration Data, Calendar Year 2015.

that there must have been at least four models available (assuming exactly 19 of each were sold). Second, UCS's methodology for ranking automakers was flawed because it selected only one year of data to review. The overall ZEV market is still in its infancy, and while some models have been available for extended periods of time, other models have come in and out of the market. Calendar year 2015 was a transitional year when several automakers were between "conversions" on models. These automakers were therefore misclassified for their efforts despite being some of the earliest to market prior to 2015.

UCS is painting a negative picture of a nascent market, suggesting that there is significant customer demand for ZEVs, but dealers nonetheless refuse to sell popular cars to customers who want them. Further, they infer that automakers are making significant profits on electric-drive vehicles but are keeping them from customers all over the country for nefarious reasons. Of course, these inferences belie common sense. The reality is that electric-drive vehicles have yet to find broad appeal, are difficult to sell, have significant limitations (range, infrastructure, weather, etc.), and are more expensive than gasoline counterparts, especially when incentives are not available. Even after accounting for incentives, the pathways to profitability for these technologies is neither clear nor guaranteed, particularly in the near term.

Another issue is ZEV cost – not the actual cost of the vehicle, but the costs associated with supporting the vehicles. Resources are needed to support the vehicles where they go, and there are other costs associated with bringing electric-drive vehicles to market, including but not limited to dealer training for sales associates, service department technician training, and installation of charging infrastructure at dealerships. Automakers have the flexibility to determine the best way to commit their resources. Plus, having a viable market is a pre-condition for committing resources to support these sales. This means that some dealers may not have electric-drive vehicles today, or volumes may be limited at dealership until there is greater demand. Customer demand is critical; if people ask for the vehicles, dealers will stock them and have them charged. If electric-drive vehicles are "hard to find" at dealerships, that is a clear indicator that there is little market demand.

Global Automakers' consumer research – conducted by the Mellman Group in coordination with the Auto Alliance in 2016 and a separate set of research conducted by Edelman in coordination with the Auto Alliance and NESCAUM – shows that lack of infrastructure is a huge barrier for customers. These surveys demonstrated that if infrastructure is not readily available or convenient to customers, consumers do not view electric-drive vehicles as viable options for their lifestyles. Global Automakers has noted above that additional work is needed by the states to build out infrastructure, and until this has been done, the lack of infrastructure will also play into a lower overall level of customer demand.

In the face of these realities, UCS is pressuring automakers into making even more models, at higher volumes, incurring more losses, and forcing conventional vehicle consumers to subsidize those vehicles. Yet the mandate, as designed, allows manufacturers to choose the best way to commit their resources, capacity, and network to rollout electric-drive vehicles, especially in these early years of the mandate.

- Dealers' efforts to market ZEV are commensurate with the demand for those vehicles. With the exception of Tesla, automakers rely on dealers to sell electric-drive vehicles to customers. The dealers are key in any new vehicle transaction; they are the face of the company for the customer. But dealerships are different from the automobile companies. Therefore time, resources, and efforts are needed to ensure dealers have the tools they need to sell all vehicles, and extras of each of these are needed when it comes to new technology, like electric-drive vehicles.

  In 2016, the Sierra Club released its "Rev Up Electric Vehicles" report.[60] This report summarized the efforts and findings from "secret shoppers," who visited dealerships to find electric-drive vehicles. Like the UCS study (above), the intention of the study (*i.e.,* to help identify areas for improvement in ZEV sales) is laudable, but the methodology and findings are woefully skewed. For example, the report's summaries suggest that all shoppers had negative experiences. Yet buried in the data, it shows that 70 percent of shoppers had a positive experience at Chevrolet dealerships. Another confusing finding was that Tesla had examples where its battery electric vehicle was not on display. This finding is strange, because Tesla only sells battery electric vehicles and only in dedicated storefronts. Other issues with the report include that the secret shoppers were not trained professionals, and therefore may well have returned biased or subjective findings. Further, some of the criteria (like having 10 vehicles on a lot) does not consider the overall size of the dealership or the number of conventional vehicles on the lot.

  The Sierra Club's report infers that dealers are a major issue when it comes to electric-drive vehicle sales without a full understanding of the automaker-dealer relationship. First, some dealers may not have electric-drive vehicles on the lot because they do not believe there is sufficient demand to justify the investment in upgrading facility, training staff and service providers, etc. Market demand dictates how dealers respond, and manufacturers do not (and cannot under state franchise laws) control dealer actions.[61] Manufacturers can, and often have,

[60] Sierra Club. "Rev Up Electric Vehicles; Multi-State Study of the Electric Vehicle Shopping Experience," August 2012. https://www.sierraclub.org/sites/www.sierraclub.org/files/uploads-wysiwig/1371%20Rev%20Up%20EVs%20Report_09_web%20FINAL.pdf.

[61] Dealer groups have increasingly raised concerns that manufacturers earn the full ZEV credit value once the vehicle is produced and delivered for sale to the dealer, and that manufacturers will therefore "dump" large volumes of ZEVs onto their lots to meet the automakers' ZEV requirements. (Letter from 14 Dealer Associations to Chairwoman Mary Nichols,

provided "incentives" to dealers to consider selling electric-drive vehicles. But, in the end, dealers make the decision to stock and sell the vehicles. More consistent market demand for electric-drive vehicles will lead to improved dealer action.

In addition, it is much more likely that dealers are initially excited to market electric-drive vehicles, but when demand settles in at a very low rate, these vehicles become harder to find on the lot. Perceived dealer issues (like having charged vehicles at the ready) are more complex than not selling or inadequate training. For instance, if customers are not requesting the vehicles, dealers will not have them, or may not have them charged, on the lot. In addition, automakers provide training to dealers about electric-drive vehicles, but between low customer demand and dealer staff turnover, dealer knowledge is not necessarily retained. Global Automakers asserts that the perceived issues with dealer availability of and knowledge about electric-drive vehicles are inherently tied to a lack of customer demand, and thus the effects of a market still in its infancy.

The UCS and Sierra Club studies both suggest that there is significant electric-drive vehicle demand and dealers are refusing to sell popular cars to customers who want them. Manufacturers cannot force electric-drive vehicles onto the dealers, and the market will take time to grow and mature. State efforts to help support dealers, educate customers, and provide customer incentives to increase demand will be fundamental to helping to grow electric-drive vehicle sales.

Finally, returning to Tesla, it is clear that even for an automaker that eschews dealers, their sales results in the Northeast ZEV states – on a proportionate basis – remain one fifth of their sales compared to California (see Figure 10 above). Whether it be dealers, product availability, the travel provision or other reasons, nearly all of the attacks on the automobile manufacturers have confused cause with effect. The fact is that the lack of market preparation in the Northeast **by the states themselves** is the largest single cause of the poor sales to-date.

Global Automakers is concerned that despite our efforts to encourage market development with the executive, legislative and regulatory branches in the Section 177 ZEV States and despite these states' accomplishments to date, the Northeast and Mid-Atlantic states are not yet prepared to support the same electric-drive vehicle requirements as California. There is a lack of critical charging infrastructure and consumer adoption rates that represents large hurdles for the states to bear. It is crucial that

California Air Resources Board, December 22, 2016). This concern is unfounded for several reasons. First, under the state franchise laws, automakers cannot "dump" vehicles onto dealers. Most state franchise laws prohibit manufacturers from forcing their franchised dealer to accept vehicles the dealer has not ordered. Additionally, manufacturers have invested significant resources into developing their electric-drive vehicles and working with dealers who want to sell them, often offering significant incentives to the dealers, which belies the notion that manufacturers would simply "dump" ZEVs on their dealers.

questions on how to continue to support the market are answered, but it is additionally important that simulations of future fleets are correct. In the interim, Global Automakers continues to believe that an adjustment to the ZEV requirements for the Section 177 States is both needed and warranted.

E. Post-2025 Considerations

The Staff Report recommends that the ZEV program for 2026 and subsequent model years should be strengthened and that changes may be needed to the credit provisions and regulatory structure to increase certainty on future ZEV volumes. Including this section in the Midterm Review diverts the Board's attention away from the critical regulatory needs through MY 2025, and it is a significant deviation from the intent of the Midterm Review. The purpose of the Midterm Review is to evaluate progress to-date with an eye toward feasibility of the requirements through 2025. The ARB Board Resolution from January 26, 2012 instructs ARB to participate in the Midterm Review of MY 2022-2025 standards. The Board did not instruct ARB to include consideration of post-2025 standards. This Midterm Review should not short-change the analysis of 2025 by focusing on the future-future.

There was no need to include post-2025 in the Midterm Review, because ARB has three other activities underway to model and consider post-2025 pathways: the 2030 Scoping Plan, the State Implementation Plan, and the Mobile Source Strategy report. These three documents represent the appropriate place for consideration of post-2025 at this time. For instance, the Mobile Sources Strategy, which is a modeling activity, states the following:

> Modeling to meet the 2030 GHG targets established by SB 32 in the ARB Mobile Source Strategy report, released in May 2016, indicates approximately three million additional ZEVs and PHEVs will be needed in 2026 through 2030.[62]

It is not appropriate to determine that this modeling activity equates to regulatory requirements, nor to predetermine that any future regulatory requirements must be based on volumes of vehicles. Global Automakers finds ARB's recommendation to "[s]et new requirements to target credit provisions and regulatory structure adjustments in order to increase certainty on future vehicle volumes…" to be completely inconsistent with the agreed-upon goals of the Midterm Review.[63] It now appears that ARB has already decided to change the nature of the ZEV program, as well as to identify changes that are needed. Global Automakers is concerned that a fundamental change, to rely on specified volumes, will not achieve the programmatic goals. This approach would be overly restrictive and more cost-prohibitive, and it would likely complicate compliance. It is also not clear that such an approach considers the impact on consumer choice and affordability. Post-2025 discussions should be handled separately from the Midterm Review.

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[62] ARB. *Advanced Clean Cars Midterm Review* at ES-6.
[63] ARB. *Advanced Clean Cars Midterm Review* at ES-6.

Further, at the time ZEV 2.0 was adopted in 2012, discussions with staff suggested that the ZEV program may not be needed after 2025. Performance-based standards for the GHG program and criteria pollutant emissions under the LEV program would continue to drive the market forward. It is not clear that the mandate is still needed if in fact it has achieved its original goal to force technology into the market in preparation for long term emissions reductions. Additional analysis is needed on whether the ZEV program is still needed, but more importantly this analysis should evaluate options for a smarter, more comprehensive approach to the challenging goals of increased fleet electrification and improved mobility.

If it is true that "[t]he conclusion is inescapable: California's vehicle future is electric,"[64] then ARB is missing the bigger picture by wanting to count numbers of vehicles. ARB should be thinking more broadly about encouraging electrification of the fleet and what it takes to support customers in the transition.

III. THE GREENHOUSE GAS PROGRAM

Global Automakers and our members strongly support the goals of the National Program for greenhouse gas (GHG) and fuel economy standards and remain committed to long-term GHG improvements. We also strongly support the goal of a National Program that is harmonized among California, EPA and NHTSA, and that alleviates unnecessary regulatory friction from three sets of overlapping regulations.

Global Automakers continues to support California's participation in the One National Program. We also strongly support California's recommendation to maintain the "deemed to comply" provision through MY 2025. That amendment was fundamental to the industry's agreement to ***One*** National Program, as it prevents automakers from having to comply with federal fuel economy and GHG emission standards, as well as separate state standards in California and each of the Section 177 States that adopted the California program.

However, we disagree with the suggestion in the Staff Report that if the stringency of the federal GHG emission standards were to be substantially changed, ARB would reassess whether compliance with the national program would continue to be appropriate. In its July 28, 2011 Commitment Letter concerning the National Program, California committed to accepting compliance with EPA's MY 2017-2025 GHG standards "***even if amended after 2012***."[65] California thus recognized that the Midterm Evaluation of the EPA standards could result in revisions to the MY 2022-2025 standards, but

[64] Spector, Mike. "Biggest Driver of Cleaner-Car Rules Is California, Not Washington," *The Wall Street Journal.* February 13, 2017. Quote from ARB Chair Mary Nichols. https://www.wsj.com/articles/biggest-driver-of-cleaner-car-rulesis-california-not-washington-1486904401.

[65] July 28, 2011 Commitment Letter from Mary Nichols at 2 (emphasis added).

nonetheless committed to maintaining the "deemed to comply" provision despite what those revisions may be.

As has been stated throughout the Midterm Evaluation, the three agencies have been working towards:

> …a single coordinated set of requirements for model years 2015 through 2025 and assured the development of environmentally superior passenger cars and other vehicles that will continue to deliver the performance, utility, and safety vehicle owners have come to expect all while saving the consumer money through significant fuel savings.[66]

Global Automakers articulated a range of comments on the substance of the GHG Midterm Review. We most recently raised these issues in our comments on EPA's Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation, which we incorporate here by reference.[67] Global Automakers has recommended the need for furthering alignment between the agencies' processes, improving upon the modeling, and enhancing the consideration of consumer demand and affordability.

Our comments on the GHG Midterm Review address the following issues:

- EPA unnecessarily accelerated its determination and failed to align with NHTSA. EPA's decision to move ahead with its determination was premature in that it foreclosed on an opportunity to assess more recent, up-to-date data. Further, it was in violation of the agency's commitment to maintain a joint and harmonized program with NHTSA for motor vehicle fuel economy and GHG emissions.[68]

[66] ARB. *California's Advanced Clean Cars Midterm Review* at ES-10.

[67] https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0827-6194.

[68] Global Automakers submitted a letter to EPA Administrator Pruitt on February 21st asking that he withdraw the Final Determination because EPA had (a) inexplicably accelerated its determination over a year ahead of schedule; (b) finalized its determination well ahead of NHTSA's rulemaking, which was in direct contravention of the agency's previous commitment; and (b) not allowed stakeholders sufficient time to provide input. We asked that Administrator Pruitt reinitiate the Midterm Evaluation to its original timeline and coordinate with NHTSA and ARB in the spirit of maintaining the One National Program. Contrary to the assertions of some stakeholders, Global Automakers has *not* asked for a rollback of the standards. Global Automakers' letter is available here: http://globalautomakers.org/media/letter/global-automakers-requests-that-epa-reconsider-its-final-determination-concerning-my2022. Further description about Global Automakers' request can be found in the February 24th blog post, "Process Matters," by John Bozzella, President & CEO of Global Automakers. The blog states, "We recognize the need for robust regulation to help ensure consistent progress toward that goal. All we're seeking in this request is a thoughtful, fact-driven exercise that gets us to our goals in the smartest way possible." The blog is available here: https://www.globalautomakers.org/media/blog/process-matters. Following the Administration's March 15th announcement to withdraw the final determination and return to a coordinated Midterm Evaluation process, Global Automakers issued a press statement in support of a Midterm Evaluation process *without a predetermined outcome*. The statement is available here: https://www.globalautomakers.org/media/press-

- Greater harmonization among the EPA, NHTSA and California programs is necessary. Greater harmonization is necessary both between the two federal agencies (EPA and NHTSA) and between the federal agencies and California. There are several areas where greater harmonization is possible between EPA and NHTSA, such as better coordination in their modeling of technology effectiveness and the agencies' treatment of various credits. Additionally, certain aspects of California's program unnecessarily complicate manufacturer compliance with the GHG emission program, chief among them is the ZEV mandate. The costs of complying with the ZEV mandate are very much a part of the cost that manufacturers will incur to comply with the GHG standards, and should have been accounted for by EPA.

- The Midterm Review must include a more robust assessment of consumer acceptance. Ultimately, the success of GHG emissions reductions requires appealing to the wants and needs of consumers. While automakers can build vehicles with cleaner and more efficient technology, real GHG emissions reductions will not be achieved if consumers do not buy and use these more efficient vehicles. It is important that consumers' motivations and actions be considered when setting and evaluating the standards. Calculations of potential future GHG benefits are contingent on consumers' willingness and ability to purchase vehicles with these new, more fuel-efficient technologies.

  Throughout its Midterm Review, ARB makes mention of consumers' sensitivity to price. The Midterm Review "confirm[s] a change in consumer preference from sedans to crossover and small utility vehicles that are not related to a reclassification of an existing model from a car to a truck."[69] Further, consumers have real-world reactions to new technologies that will continue to have a great effect on the success of the GHG program and should be further considered incorporated into the agencies' modeling. Looking at publicly-available consumer acceptance data, there are indications of significant barriers to the adoption of fuel-saving technologies required to meet the standards. Balancing theoretical modeling with issues encountered in the real-world when developing standards is key to creating a program that is not only protective to society but also considers the effects on all stakeholders.

- The agencies' assessment of technological effectiveness was overly optimistic and underestimated the amount of advanced technology (e.g. electrification) necessary to comply with the standard. Global Automakers raised a number of concerns about the shortfalls in EPA's modeling and assumptions. The consequences of these shortfalls are that to meet the standards, manufacturers must apply more technologies (and more costly technologies) to vehicles than the agencies predicted. These higher costs have a direct impact on consumer

release/automakers-applaud-white-house-action-on-vehicle-ghg-midterm-determination. Global Automakers will continue to work with ARB, EPA and NHTSA and provide information to help inform the Midterm Evaluation.

[69] ARB. *California's Advanced Clean Cars Midterm Review* at ES-25.

demand and affordability, especially given customer price sensitivity. Several errors were pointed out at the time of the Draft Technical Assessment Report (TAR); these errors were not subsequently addressed in EPA's Proposed Determination or Final Determination.

- The Midterm Review should assess how additional flexibilities can further the goals of the program and ease manufacturer compliance burdens. In evaluating the current GHG emission standards, it is important to look not only at the appropriateness of vehicle footprint curves but also at regulatory frameworks and policy mechanisms to assess whether they are meeting regulatory objectives in a reasonable, cost-efficient manner. As the GHG emission standards become more stringent, certain flexibilities should be considered that would help reduce the cost of compliance while remaining true to the overall program goals. Global Automakers also believes there is a strong need for continued recognition of the benefits of innovative technologies, such as various off-cycle technologies and other advanced technologies including electric-drive vehicles. In meetings and discussions between EPA staff and Global Automakers, EPA staff acknowledged the need for updating key policy flexibilities even if the standards were kept unchanged.

Global Automakers believes that these elements will provide a more robust analysis of the MY 2022-2025 GHG standards, and we look forward to continuing to coordinate with ARB, EPA, and NHTSA throughout the Midterm Evaluation process.

IV. PARTICULATE MATTER STANDARDS UNDER THE LOW EMISSION VEHICLE PROGRAM

The LEVIII program has provided significant emission reductions since its inception, and LEVIII is resulting in a greater than 75 percent reduction in vehicle emissions in MY 2015-2025 compared to LEVII. Automakers are implementing the LEVIII standards at the same time they significantly reducing GHG emissions and increasing volumes of electric-drive vehicles under the ZEV program. As a result, light-duty vehicles represent a smaller and smaller portion of the emissions inventory in the state. Global Automakers supports the need to improve air quality, but we also caution that there is a careful balance the various regulatory needs and costs of having to simultaneously comply with numerous requirements under several programs.

ARB has made the following findings with respect to the 1 milligram per mile (mg/mi) particulate matter (PM) standards under the Low Emission Vehicle (LEV) program:

1. Maintain the existing PM emission gravimetric measurement method for the 1 mg/mi standard.

2. Maintain the stringency and implementation schedule for the adopted 1 mg/mi PM standard starting in the 2025 model year with a four-year phase-in.
3. Develop more comprehensive PM emission standards to phase-in with the 1 mg/mi standard in the 2025 model year to ensure manufacturers implement robust control strategies that result in low PM emissions in the real world.

Global Automakers and our members are committed to improving air quality and reducing emissions of particulate matter (PM). Our members are investing in facility upgrades to meet new test requirements and improve measurement accuracy. Global Automakers agrees with the staff's recommendation to maintain the gravimetric measurement method and the 1 mg/mi PM standard starting in MY 2025. Global Automakers recommends continued collaboration and additional comparative testing between ARB and the automakers on PM standards as explained below.

A. Gravimetric Measurement

Global Automakers supports ARB staff's recommendation to maintain the gravimetric measurement method at this time. ARB's decision was based on extensive testing and a review of relevant literature. The agency's research included evaluation of several alternative PM measurement methods, some of which offered potential benefits.

Automakers, however, have raised concerns that PM measurement at these very low levels still has many unknowns. First, variability observed during testing shows the 1 mg/mi standard results in little or no compliance margin. Second, the current data may not be representative of the vehicle fleet produced in 2025. Finally, automakers have been in the process of updating test facilities and procedures, which will likely take several years, making it difficult to compare test results with those from ARB. Global Automakers recommends additional studies, including round robin testing between the agency and automakers, using Part 1066 compliant labs and representative vehicles, to continue evaluation of this issue.

Global Automakers supports ARB's commitment to continue to track further development of these methods to ensure that ARB's PM measurement capabilities remain at the forefront of PM emission metrology and technology. Global Automakers is particularly interested in maximizing the efficiency and efficacy of test procedures to ensure the best use of time, funding, and engineering resources in achieving the desired environmental results. Our members are continuing to devote extensive resources to the GHG emissions control program, and this is expected to be a continued long-term requirement, given California's and others' 2050 GHG reduction goals.

B. Maintain the Stringency and Implementation Schedule

Global Automakers supports the ARB staff's recommendation to maintain the previously-adopted 1 mg/mi standard PM emission FTP standard applicable in 2025 model year with a four-year phase-in.

In its Midterm Review, ARB found that the 1 mg/mi was technically feasible based in part on the trends in PM emissions from technologies that are being implemented to meet the interim 3 mg/mi FTP standard. The Midterm Review found that various technologies are being refined that will allow in-cylinder control of PM to meet the 1 mg/mi standard at little to no added cost. In addition, there is the option for manufacturers to use after-treatment control of PM using gasoline particulate filters (GPF), albeit at higher cost. However, due to the higher cost of GPFs, most manufacturers will likely use this technology only where it is essential to meet standards. Much additional research and development efforts are needed so that PM emissions are controlled to these low levels while optimizing the GHG and other emissions of future vehicles. Therefore, Global Automakers agrees with the ARB staff's recommendation to maintain both the stringency and the implementation schedule beginning in MY 2025 with a four-year phase-in. The latter is essential to maintaining the flexibility and the lead-time needed by manufacturers.

Global Automakers would note, however, that ARB found that in-cylinder PM control may be available for little or no cost. To be clear, this finding is related to the cost of hardware and manufacturing. ARB's finding does not appear to include the extensive engineering resources and the cost burden of annual PM certification and in-use testing that manufacturers make.

C. More Comprehensive Standards

In its Midterm Review, ARB identified the potential for PM emission control to vary under some operating modes with some models. As a result, ARB is interested in further research to assess the need, feasibility, and value of establishing PM standards for other operating cycles, such as the aggressive driving cycle (US06) or other test cycles or ambient temperatures not currently represented in the Federal Test Procedure (FTP) used for the 1 mg/mi standard.

Global Automakers will work with ARB to stay abreast of these issues. However, Global Automakers believes it is important to note that the light-duty portion of the PM2.5 inventory should be kept in perspective and considered in terms of other necessary investments. Based on the latest PM2.5 emissions inventory available on the ARB website, ARB estimates that the 2015 PM2.5 emissions from all sources totaled about 148,500 tons. Further, ARB estimates that the total mobile source PM2.5 emissions in 2015 was about 25,000 tons (about 17 percent of the total PM2.5 emissions). Finally, ARB estimates the light-duty share of PM2.5 emissions in 2015 was about 6,000 tons (about 4 percent of the total PM2.5 emissions).

Given the small size of the light-duty PM2.5 emissions inventory and thus the smaller additional reduction that may be available from additional action, the time, funding, and engineering resources needed for any additional actions should be compared to other priorities. In particular, looking at the current emission testing results included in ARB's staff report, it appears that the FTP and US06 tests are both on track to measure similar real-world emissions situations. In most cases, the PM data provided by ARB for the US06 tests tracks at approximately double the FTP testing results for PM. If future test data continue to bear this finding, an update to the US06 test procedure to further control PM would likely be costly, with no added emissions benefit, and thus would seem unnecessary. Since the long-term picture for 2025 and beyond appears to focus on electrifying the fleet, we need to be more efficient and smarter about how we invest in technology, research and development and emissions benefits. If the overall goal is to electrify the fleet, it would seem inconsistent to devote resources for such a small portion of emissions that would be transitioned out of the fleet as more electric-drive vehicles become part of the fleet.

V. CONCLUSION

We appreciate your consideration of Global Automakers' comments on the ARB Midterm Review. We look forward to working further with the Board on a robust, data-driven Midterm Review that achieves long-term reductions in GHG and criteria pollutant emissions, ensures the feasibility of the MY 2022-2025 GHG, ZEV and LEVIII requirements, and accounts for the needs of the car-buying public.