



March 20, 2017

California Air Resources Board  
1001 I Street  
Sacramento, CA 95814

Subject: Tesla comments to California's midterm review of the Advanced Clean Cars Program

Chair Nichols and Members of the Air Resources Board:

I am writing on behalf of Tesla to emphasize how critically important the Zero Emission Vehicle (ZEV) regulation is to spurring industry-wide commitment to Electric Vehicle (EV) programs and achieving California's emissions reduction goals. With this in mind, we are concerned over staff's proposal to delay modifications to the ZEV regulation until 2026. Since the 2012 ZEV rulemaking, the supply of compliance credits has increased by over 350%, severely limiting the regulation's ability to drive an increasing market share of EVs.<sup>1</sup> As a result, traditional automakers have very little near-term motivation to enhance EV product offerings and pursue compelling, mass-market programs. This delays the transition to sustainable transportation and puts California at risk of failing to achieve its 2030 Greenhouse Gas (GHG) emissions reduction goal. As elaborated in the remainder of this letter, we urge the California Air Resources Board (CARB) to take immediate action to address weaknesses in the ZEV regulation and provide clarity for the automotive industry as to how the future standards will be modified.

**I. ZEV credit oversupply has severely impacted the trajectory of the regulation.**

In 2012, CARB adopted 2018 – 2025 ZEV credit requirements with the understanding that the targets would result in EV technology representing 15.4% of new car sales in 2025.<sup>2</sup> Updated analyses from CARB staff, the Natural Resources Defense Council (NRDC) and Tesla reveal that the current trajectory of the ZEV regulation will result in only 6% to 8% EV sales in 2025.<sup>3</sup> This represents a loss of 48% to 61% of the 2025 market share that was anticipated when the standards were set just five years ago. The updated trajectory reflects an incredibly low bar for the industry to achieve when compared to current sales figures. Specifically, the zero-tailpipe emission vehicle portion of the regulation can be met with 2% to 3% ZEV sales in 2025, yet California already achieved 2% ZEV market share in 2016.<sup>4</sup> This means that automakers could comply with the regulation for nearly another decade with little-to-no increase in ZEV sales as a percentage of total vehicle sales. The Plug-In Hybrid Electric Vehicle (PHEV) portion of the requirement (4% to 5%) is also quite low

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<sup>1</sup> CARB reported data shows that pure ZEV credit balances have increased from 76k in Oct 2012 to 345k in Aug 2016

<sup>2</sup> CARB 2012 Advanced Clean Cars rulemaking (<https://www.arb.ca.gov/newsrel/newsrelease.php?id=282>)

<sup>3</sup> NRDC report: Manufacturer Sales Under the Zero Emission Vehicle Regulation, Jul 2016 (6% ZEV/PHEV sales in 2025)

CARB Advanced Clean Cars Midterm Review, Jan 2017 (8% ZEV/PHEV sales in 2025 under mid-range scenario)

Tesla analysis (7% ZEV/PHEV sales in 2025)

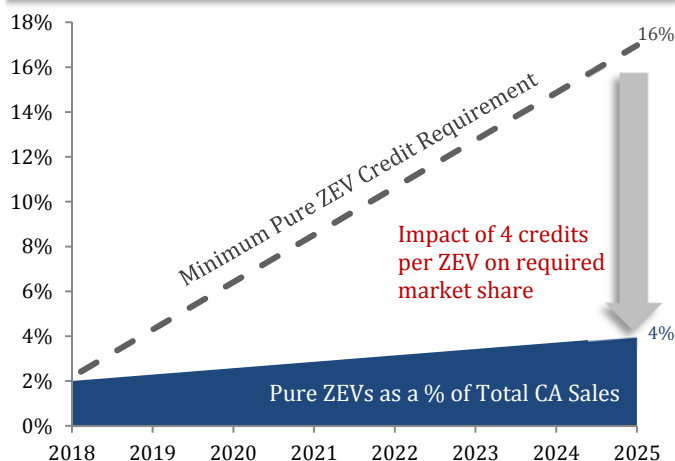
<sup>4</sup> Polk registration data for CY2016

considering the fact that sales of hybrid and plug-in hybrid vehicles represent 6% of California new car sales today.<sup>5</sup>

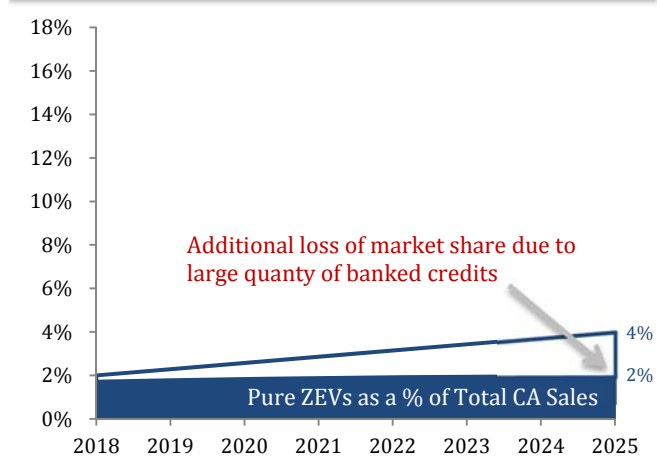
At the core of the problem is an oversupply of compliance credits. For years, the ZEV credit requirements were held at very low levels while generous credit multipliers were awarded for each ZEV delivered. Since the 2018 – 2025 targets were adopted, ZEV technology has advanced rapidly, and the industry has amassed a credit reserve of over 345,000 ZEV credits.<sup>6</sup> This credit balance will continue to expand leading up to 2018.

To illustrate the impact excess credits have on ZEV market share, consider the 2025 minimum zero-tailpipe emission vehicle credit requirement of 16% of sales.<sup>7</sup> If each ZEV delivery earned one credit, manufacturers would need 16% of their total California sales in 2025 to be zero emission vehicles.<sup>8</sup> In reality, the regulation grants up to four credits per ZEV, enabling manufacturers to comply with no more than 4% ZEV sales (see Exhibit A).<sup>9</sup> The requirement is further diluted by the fact that automakers can apply their large banked credit reserves to offset future requirements, resulting a final market share of only 2% in 2025. This represents no improvement from today’s level (see Exhibit B).

**Exhibit A: Impact of 4 credits per ZEV delivery**



**Exhibit B: Impact of additional banked credits**



There is now compelling analytical consensus that the trajectory of the ZEV regulation has fallen dramatically from the levels anticipated by CARB in 2012. Fortunately, this problem can be addressed and the regulation can be realigned with the goals of the state with relatively straightforward adjustments to the program. We provide specific recommendations in Section III of this letter.

<sup>5</sup> Polk registration data for CY2016

<sup>6</sup> CARB reported data as of Aug 2016; represents ZEV credits only; does not include PHEV credits and other credit categories

<sup>7</sup> CARB’s total 2025 credit requirement is 22%, of which 6% can be met with PHEV credits

<sup>8</sup> Illustrative example; the market share would be even less than this due to the fact that automakers can use trailing average sales for their credit requirement calculations.

<sup>9</sup> Starting in 2018, ZEVs with ~245 miles of advertised range (350 miles of UDDS range) earn 4 credits each

**II. The ZEV regulation must be recalibrated to ensure that California meets its 2030 GHG emissions reduction goal.**

With the passage of Senate Bill 32, California formalized its goal of achieving a statewide greenhouse gas emissions reduction of 40% below the 1990 level by 2030. CARB's latest Scoping Plan Update forecasts that the state will need at least 4.2 million EVs delivered by 2030 in order to achieve the emissions reductions targeted for the transportation sector.<sup>10</sup> The current trajectory of the ZEV regulation, however, results in only 1.0 million to 1.2 million cumulative EV deliveries by 2025.<sup>11</sup> This creates a compliance scenario that is heavily back-weighted, where California would need approximately three million EVs delivered between 2025 and 2030 in order to hit its goal. This represents an increase in EV deliveries of ~400% versus the prior five-year period currently covered by the ZEV regulation (2020 – 2025). California stands a much better chance of achieving its 2030 goal if meaningful market share milestones are established leading up to 2025. These milestones will reduce the back-weighted nature of the compliance trajectory and give California time to address market challenges if the industry lags behind. Furthermore, if CARB takes action to set these milestones and adjust the ZEV regulation today, it will send a clear signal to the automotive industry that the state is serious about its 2030 goal. If CARB takes no action, automakers may hold the view that it is unlikely CARB will successfully implement such a steep increase in the regulation starting in 2026. These automakers are likely to delay investments in high-volume EV programs until there is certainty around whether CARB will take action. To prevent this from happening, CARB should immediately address the severe impact of credit oversupply and recalibrate the standards to achieve near-term milestones that will yield meaningful progress prior to 2026.

**III. CARB should take action today to recalibrate the regulation toward meaningful market share milestones to be achieved prior to 2026.**

There are two primary levers that CARB can pull to correct the credit oversupply and drive higher volumes of EV deliveries: 1) increase annual credit requirements and 2) reduce credits earned for each EV delivered. CARB could adjust one or both of these levers to achieve the desired market share result. This type of change could be implemented with very few adjustments to the fundamental structure of the regulation, yielding an optimal combination of effective regulatory recalibration with consistency in CARB's approach to industry compliance. We recommend this incremental approach over drastic changes to the regulation. Large-scale structural changes will result in a prolonged rulemaking process, increased regulatory uncertainty and the risk that new compliance loopholes will be added into the program. Furthermore, many automakers have purchased credits with the understanding that those credits could apply to future model years under the current set of rules. Automakers that invested in these credits would be harmed if CARB makes structural changes that fundamentally alter how credits can be used in future model years.

Of the credit alternatives proposed by CARB in Section IV (Appendix I) of the Advanced Clean Cars Midterm Review, we believe that Alternative 1(b) shows the greatest potential. The primary advantage of this approach is that it recalibrates ZEV credits around one credit per car and awards credits to ZEVs and PHEVs based on their relative contribution to emissions-free driving. If CARB chooses to pursue this approach, it will be necessary to periodically update the Zero Emission Vehicle Miles Travelled (zVMT) data from the EV fleet to ensure that the crediting accurately reflects real-world driving and charging behaviors. We also encourage

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<sup>10</sup> CARB 2017 Climate Change Scoping Plan Update, Table II-1. Proposed Scoping Plan Scenario, Jan 2017

<sup>11</sup> Includes both ZEVs and PHEVs; CARB analysis: ~1.2M cumulative vehicles; Tesla analysis: ~1.2M cumulative vehicles; NRDC analysis: ~1M cumulative vehicles

CARB to use next-generation, longer-range ZEVs as the basis for the denominator of the credit calculation, rather than the current generation Nissan Leaf.<sup>12</sup> The 2015 Nissan Leaf, which recorded an average zVMT score of 10,294 miles, has only 84 miles of advertised range. Next-generation EVs will all have over 200 miles of advertised electric range, so the 2015 Nissan Leaf is not an appropriate benchmark for crediting in the post-2018 timeframe. Tesla's zVMT rating of 13,494 is a better representation of the baseline zVMT that CARB can expect from next-generation EVs. CARB highlighted this observation in Alternative 4, where Tesla's Model S VMT was used as the denominator of the credit equation. We do not support Alternative 4, however, due to the fact that it includes a large credit multiplier, and the crediting is based on Electric Vehicle Miles Travelled (eVMT) rather than Zero-Emission Vehicle Miles Travelled (zVMT). On a similar note, Alternatives 2, 3 and 5 also include credit multipliers that will only serve to exacerbate the credit oversupply situation and hinder the regulation's ability to drive higher volumes of EVs.

Alternative 5 considers using Internal Combustion Engine (ICE) VMT as the basis for the credit formula. We do not support this approach, as electric vehicles are not currently deployed in vehicle segments at the same ratio as ICE vehicles (e.g. light trucks, sport utility vehicles, etc). Over time, as EVs are deployed in greater numbers across every vehicle segment, ICE VMT and ZEV VMT will converge. For now, however, we recommend that CARB base the crediting on zVMT relative to next-generation, long-range EVs.

With respect to Alternative 6, we believe that EPA label range (5-cycle test) is more appropriate for a range-based crediting structure than the Urban Dynamometer Driving Schedule (UDDS). UDDS range does not reflect real-world performance of EVs, and the use of this range figure has resulted in inflated credit generation. That being said, adjusting the current crediting structure to use EPA label range rather than UDDS range is not sufficient to recalibrate the regulation to a meaningful market share result. For this reason, Alternative 1(b) would yield a stronger EV trajectory than Alternative 6.

#### **IV. Delaying modifications to the ZEV regulation will significantly harm EV manufacturers, including Tesla, who are investing heavily today to advance California's EV market.**

Despite clear evidence of the credit oversupply and compelling analysis revealing the severe impact it will have on the regulatory trajectory established by the Board in 2012, CARB staff are still recommending that the Board make no changes to the regulation until 2026. This delay will not only put California's 2030 GHG emissions reduction goal at risk, it will also significantly harm electric vehicle manufacturers. This harm results from the fact that the credit oversupply has caused the value of ZEV credits to plummet, and automakers are forgoing decisions to purchase credits until such time as CARB provides clarity regarding how the future standards will be modified.

While Tesla's success is not dependent on ZEV credit sales, regulatory credits have provided an important source of capital to help us forge the market for electric vehicles in California. Tesla has used these funds to invest millions of dollars in the state, including increasing production capacity at our Fremont manufacturing facility and expanding our network of charging infrastructure. To date, Tesla has installed 452 Superchargers and 1,060 "destination" chargers in California, enabling convenient, zero-emission travel across the entire state. As we invest hundreds of millions of dollars in California to ramp up manufacturing of our mass-market Model 3 electric vehicle, it is critical that CARB shows strong support for the state's EV goals and commitment to a robust ZEV regulation.

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<sup>12</sup> CARB's proposed denominator of 10,000 miles appears to be based on the Nissan Leaf's reported average zVMT of 10,294 miles

**V. Consumers are readily embracing compelling, no-compromise electric vehicles.**

Automakers point to plateauing sales of their first generation EV products as an indication that the broader market is not ready to embrace ZEV technology. Nothing could be further from the truth. As an automaker fully committed to accelerating the adoption of electric vehicles, Tesla has shown that a compelling combination of range, safety and performance unlocks category-leading sales potential for EVs. In 2016, Tesla's Model S sedan outsold every vehicle in its segment in the U.S., including popular combustion engine models such as the Mercedes S-Class and BMW 7-Series.<sup>13</sup> Customer orders for Model S and X increased by 49% in the fourth quarter of 2016 compared to the same period in 2015, and Tesla's Model X recently won the Golden Steering Wheel (Das Goldene Lenkrad), one of the most prestigious automotive awards in the world. The unveiling of our mass-market, \$35,000 Model 3 vehicle sparked the highest single-day sales event of any product in history, with thousands of California residents lining up hours before stores opened to place reservations. Within two months of the Model 3 unveiling we received 373,000 global deposits for the vehicle. Despite strong evidence that consumers will enthusiastically adopt compelling, next-generation EVs, incumbent automakers will continue to delay investments in mass-market programs until there is sufficient regulatory pressure motivating them to action.

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In summary, the rapidly increasing supply of compliance credits has caused the trajectory of the ZEV regulation to fall dramatically since the Board adopted the standards in 2012. Immediate action is required to recalibrate the ZEV crediting structure and ensure that California achieves meaningful EV market share milestones by no later than 2025. If the state is serious about its goal of achieving a 40% greenhouse gas emissions reduction by 2030, then the ZEV regulation underlying this goal must motivate near-term action from the entire automotive industry. Extensive analysis has demonstrated that the current state of the regulation will motivate little more than the status quo for nearly another decade.

The impact of CARB's decision on this issue will extend far beyond the borders of California. As a global incubator for environmental policy and a leader in ZEV technology development, California has the potential to profoundly impact the future of sustainable transportation. In the almost 30-year history of the ZEV regulation, the Air Resources Board has never had a more compelling picture of EV market acceptance and technology readiness as it does today. If there has ever been a time to take bold action, the time is now. Your decision on this matter will make all the difference.

Sincerely,



Ken Morgan  
Director, Business Development & Government Affairs  
Tesla

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<sup>13</sup> Source: Polk registration data for CY2016