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November 3, 2021
Joshua Cunningham, Chief
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Emissions Compliance, Automotive Regulations & Science Division
California Air Resources Board
1001 I Street
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RE: Comments on the October 13, 2021, Advanced Clean Cars II Workshop

The Union of Concerned Scientists (UCS) thanks the California Air Resources Board (CARB) for the opportunity to give comments on the development of the Advanced Clean Cars (ACC) II regulation. UCS delivered comments (as part of the Clean Cars Coalition) on the August ACCII workshop, and we remain concerned that CARB's current proposal for the regulation fails to advance the deployment of zero-emission vehicles (ZEVs) as quickly as possible and falls well short of the pace and scale that climate science dictates.

The ZEV sales requirements for model years 2026 through 2030 are too low

The current proposal fails at ensuring the rapid transition to ZEVs needed to meet the State's goals. Specifically, the ZEV sales requirement is far below the light-duty ZEV sales trajectory in CARB's own Mobile Source Strategy. The starting point for model year 2026 is also too low based on current evidence of ZEV sales in California and other jurisdictions and has not changed despite recent evidence that the ZEV market and investments in manufacturing are accelerating.

It is clear that to reduce emissions of climate changing emissions and smog-forming pollutants to meet the state's goals, CARB must set a course that greatly reduces new combustion engine vehicle sales. To date, CARB has not provided data supporting their conclusion that 25 percent ZEV sales for model year 2026 is the maximum feasible standard that could be enforced. The sole source of information about the ZEV sales stringency was the presentation shown during the May 6th ACCII workshop. CARB presented a slide indicating that automakers estimated that 25 percent sales would be reached in model year 2023 (figure 1), three years earlier than the proposed rule requires. Since the May 6th workshop, automakers have made numerous announcements of new electric models and investments in electric vehicle and battery manufacturing capacity. For example, in September Ford Motor Company announced new battery facilities totaling 129 GWh of annual manufacturing capacity, enough batteries to build over 1.4 million extended-range Ford Mustang Mach-E SUVs a year.[1] General Motors announced a new electric pickup truck

[1] https://media.ford.com/content/fordmedia/fna/us/en/news/2021/09/27/ford-to-lead-americas-shift-to-electric-vehicles.html

and promised 20 electric models in North America by 2025.[2] Stellantis also announced major investments into ZEV research and manufacturing this July.[3] CARB should reevaluate the proposed baseline ZEV stringency in light of this new data on increased industrywide ZEV production capacity.

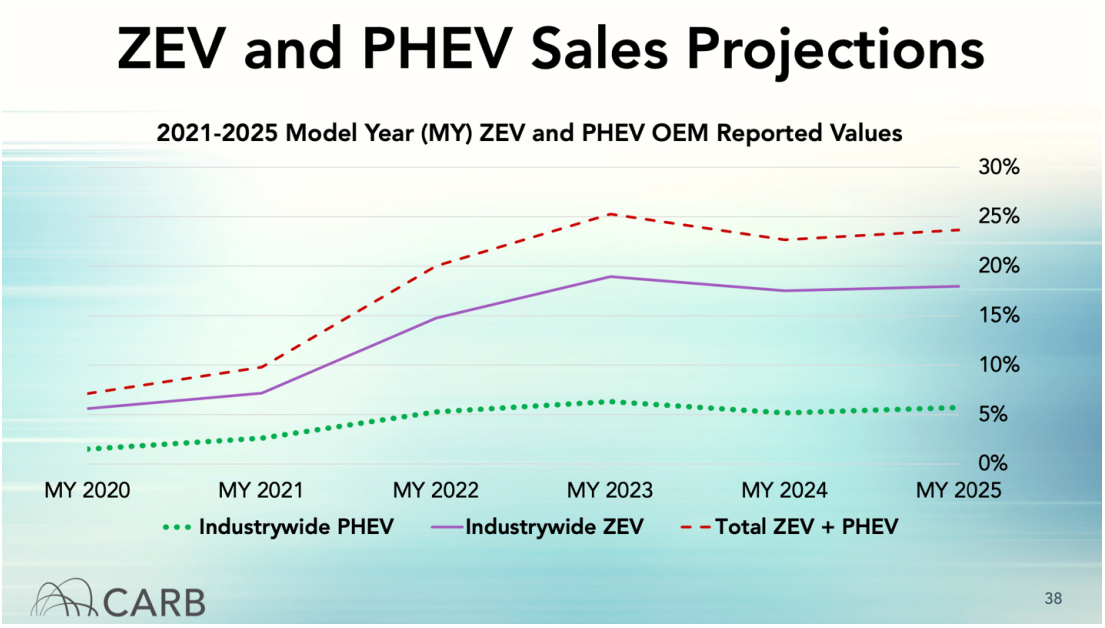

Figure 1: Industry ZEV production estimates from May 6, 2021, CARB ACCII Workshop show automakers are projecting to meet the proposed ZEV regulation's model year 2026 target 3 years earlier.

CARB's proposed ZEV sales requirements are also lower than other scenarios shown during the May 6th workshop (Figure 2). CARB's proposed rule is lower than all three scenarios ("ASAP", "Slow Phase", and "Delayed Fuel Cell Deployment") for the 2026 – 2030 time period, and requires significantly lower sales in 2026, especially compared to the "ASAP" scenario. CARB should promulgate a ZEV regulation that is consistent with these more aggressive scenarios.

[2] https://media.gm.com/media/us/en/gm/news.detail.html/content/Pages/news/us/en/2021/apr/0406-factory0.html
[3] https://www.cnbc.com/2021/07/08/stellantis-to-invest-35point5-billion-in-evs-and-new-technologies-by-2025.html

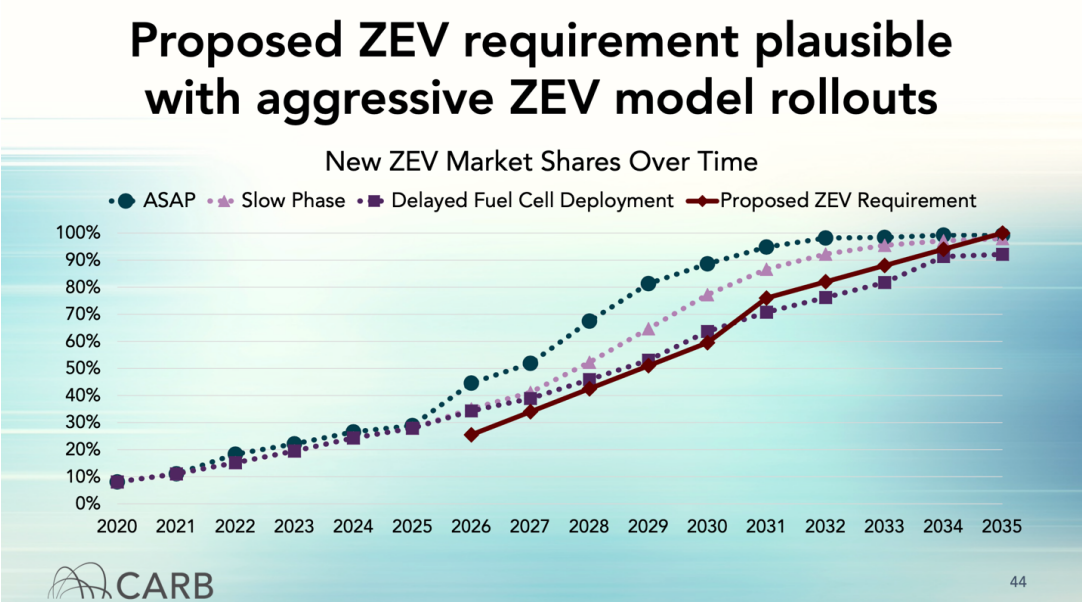

Figure 2: CARB ZEV sales scenarios show the proposed regulation could be significantly more stringent and the rationale for the lower requirement is not clear.

Current ZEV sales are constrained by supply of models

Model-level ZEV sales show vehicle supply and model availability is currently limiting the market. The failure of all manufacturers and brands to offer a ZEV option (and at meaningful volumes) is a problem that the ZEV regulation is expressly designed to address. Currently, California new car sales are 12% ZEV sales, despite large number of brands without a single ZEV option (Table 1).[4] The current ZEV sales rate is 15% when excluding nameplates without 2021 or 2022 ZEV models available for sale. A strong ZEV rule will make sure that cleaner options are available from more manufacturers.

[4] Calendar year 2021 new car registrations through July 2021 based on Atlas Public Policy / IHS Markit data

Table 1: Non-ZEV brands totalling over 170,000 sales in 2021 to-date make up about 16% of market.[5]

Brands without a model 2021 or 2022 ZEV sale in calendar year 2021 (ordered by sales volume)	2021 California sales to-date (July 2021)
Mercedes-Benz	39,600
Lexus	33,300
Mazda	27,400
Ram	20,800
GMC	16,900
Dodge	10,600
Acura	9,600
Cadillac	5,800
Infiniti	4,200
Buick	3,800
Genesis	2,600
Others	3,800
Total	**(16% of total sales) 178,300**

All regulated automakers are global entities and have demonstrated ability to quickly ramp up ZEV deployment when needed to meet regulatory requirements in other jurisdictions. For example, plug-in electric vehicle sales in Germany were at 2% sales as recently as 2018, well below the rate in California at the same time (8%).[6] Plug-in sales in Germany have greatly increased, reaching 29 percent in September 2021, showing that automakers can respond quickly to more aggressive regulatory requirements (Figure 3). In addition, in Germany, the model mix of plug-in vehicles is diverse, with no one EV manufacturer dominating, compared to California where a ZEV-only manufacturer dominates sales (Table 2). Increasing the ZEV requirement will ensure that all automakers bring ZEV models to market in sufficient volumes to meet air quality and climate targets.

If automakers can ramp up from near zero to over 25% in 4 years in a larger market than California, ARB's proposal to go from the current level of 12% ZEV sales to 25% in model year 2026 is not strong enough and will clearly lag other parts of the world. CARB needs to show leadership at this crucial transition period for the passenger car market by requiring more ZEV sales starting in model year 2026.

[5] Data source: Atlas Public Policy / IHS Markit

[6] https://www.kba.de/DE/Statistik/Fahrzeuge/Neuzulassungen/MonatlicheNeuzulassungen/monatl_neuzulassungen_node.htm , https://www.cncda.org/wp-content/uploads/Cal-Covering-4Q-18.pdf

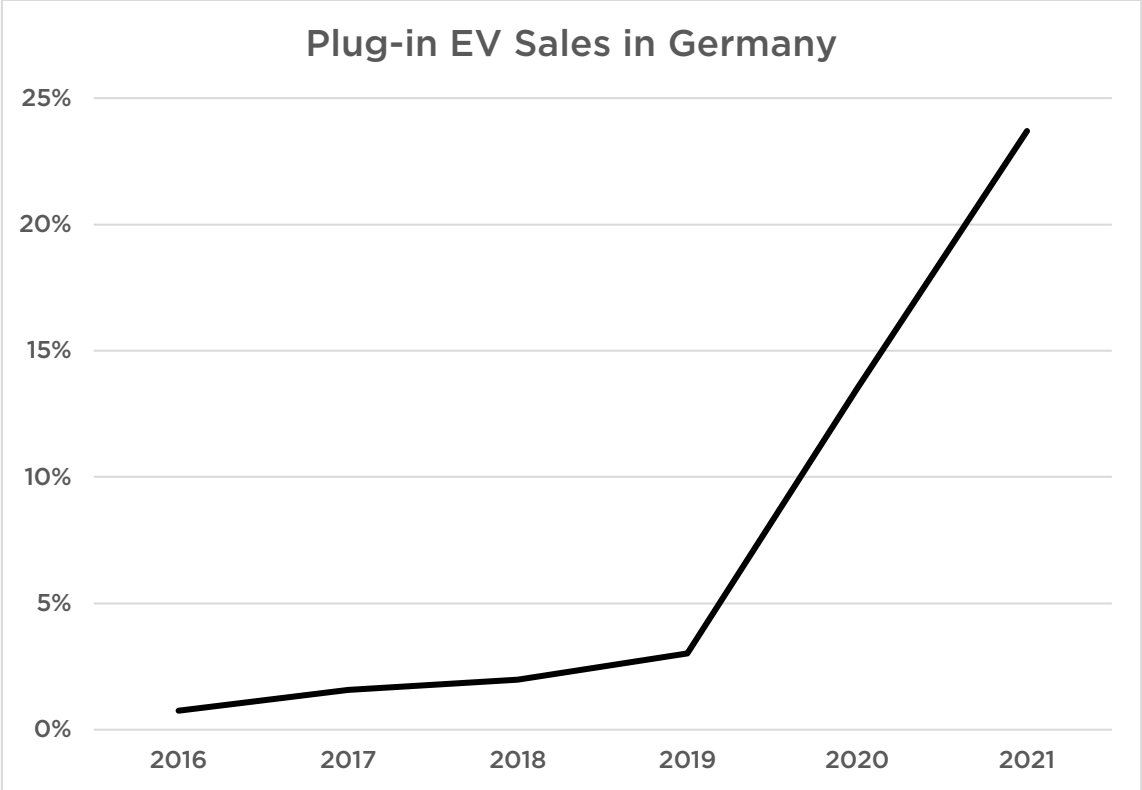

Figure 3: Plug-in electric vehicle sales in Germany show automakers can quickly ramp up sales in response to regulation. Sales shown for 2021 through September.

Table 2: California's ZEV sales are dominated by a few high-volume models, while German ZEV sales are spread among many more models of ZEVs. Regulation is key to ensure adequate supply of EV models.

2021 California ZEV Sales		2021 Germany ZEV Sales	
Model	**% Of ZEV Sales**	**Model**	**% Of ZEV Sales**
Tesla Model Y	27%	Tesla Model 3	5%
Tesla Model 3	21%	VW Up	5%
Toyota Prius Prime	8%	VW ID.3	5%
Chevrolet Bolt	6%	VW Golf	3%
Toyota RAV4 Prime	3%	Mercedes GLK, GLC	3%
Ford Mustang Mach-E	3%	Renault Zoe	3%
Volkswagen ID.4	2%	Hyundai Kona	3%
Nissan LEAF	2%	Ford Kuga	3%
Jeep Wrangler	2%	Seat Leon	2%
Audi e-tron	2%	Smart ForTwo	2%
Total of top 10 models	**75%**	**Total of top 10 models**	**34%**

CARB has the ability to propose a more stringent ZEV regulation as part of ACCII. In the alternative, CARB needs to propose an alternative pathway for the Standardized Regulatory Impact Assessment that reflects the climate and air quality goals of the state and takes into account the ability of manufacturers to move quickly to ZEVs. CARB should replace the "Alternative 2" scenario with a ZEV sales requirement requiring 45% sales in model year 2026 and at least 75% by model year 2030.

Cost data assumptions are incorrect and opaque

CARB has presented data on the estimated purchase costs for battery electric (BEV), plug-in hybrid (PHEV), and fuel cell electric vehicles (FCEV), including an Excel workbook. The results of CARB's analysis are inconsistent with other analysis of ZEV costs (such as from the International Council on Clean Transportation, Bloomberg New Energy Finance, and the National Academies of Science), with BEV costs significantly higher than other studies.[7]

Required BEV range is a primary determinant of BEV costs in CARB's analysis. CARB has chosen to use a 300-mile average range for 'base' model BEVs, despite most current long-range non-luxury vehicles having a range below 300 miles. 'Premium' BEVs in CARB's analysis are modeled as having 400-mile average range, again higher than the range of most current premium BEVs on sale today. If CARB instead used 250- and 350-mile ranges for 'base' and 'premium' BEV models, initial vehicle costs would drop by $790 to $1,284 and several BEV models would have lower acquisition costs than a gasoline-only vehicle. Given that long-range BEVs today have lower range and are driven as many or more miles a year than the average gasoline car, CARB needs to revise the required BEV range in its cost model.[8] Infrastructure (including higher deployment of 350kW charging) will be more developed at the end of this rule that will allow longer trips with lower battery capacity and CARB's used ZEV assurance measures will mean that even a 250-mile range new BEV will have at least 200 miles range, both factors that argue for using a lower range for the BEV cost estimates.

CARB should also reexamine the treatment of vehicles that require towing capability. While the assumptions behind the selection of vehicles for the extra towing cost are not clear from the presentations and workbook, it is our understanding that the determination was made partially on gasoline vehicle engine size. Towing capability on BEVs and FCEVs may not be needed on the same number of vehicles as currently have towing capability, as the towing ability may have been bundled with other features such as all-wheel drive or premium option packages. CARB should also reexamine the assumptions that require large increases of

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[7] https://theicct.org/publications/update-US-2030-electric-vehicle-cost , https://about.bnef.com/blog/behind-scenes-take-lithium-ion-battery-prices/, https://www.nationalacademies.org/news/2021/03/zero-emission-vehicles-represent-the-future-of-energy-efficiency-petroleum-and-emissions-reductions-in-2025-2035-new-report-says

[8] http://ww2.arb.ca.gov/sites/default/files/classic/research/seminars/tal/12_319_seminar.pdf

battery capacity on towing package BEVs. CARB's cost model for pickup trucks requires between 102 and 131 kWh of *additional* battery capacity. In the case of the 'base' BEV pickup model, this additional battery is larger than the battery in non-towing models (i.e. more than double the battery capacity), meaning that the 'base' BEV pickup model is modeled as having over 600 miles of range when not towing, an absurd result which guarantees a vehicle cost much higher than other powertrain options. Because CARB's fleet model does not choose BEV pickups, these choices do not directly impact the average incremental vehicle cost. However, inflated BEV costs result in only PHEVs and FCEVs being available for medium SUV and pickups with a towing package. Correctly modeling BEV towing costs (combined with a lower range requirement) will allow CARB's fleet model to choose some BEV models for towing, reducing overall fleet incremental costs. It will also reflect the current conditions, where multiple towing-capable BEVs will be available by the end of 2022 while no PHEV or FCEV pickup models are slated to be available.

Finally, CARB needs to devote adequate resources to fully document the assumptions and estimates used in the cost workbooks and fleet model. It is not possible for stakeholders to fully participate and comment on the development of the ZEV regulation without understanding the technical basis for CARB's analysis and assumptions.

Lower starting targets result in significant increase in emissions

CARB's choice to start at 76% non-ZEV vehicles (81% of vehicles will have tailpipes when including PHEVs) in model year 2026 ensures significant emissions into the late 2030s assuming the average lifetime of conventional passenger vehicles remains constant.

If instead, CARB chooses a ZEV sales requirement consistent with the Mobile Source Strategy, such as the "ASAP" scenario from the May 6th ACCII workshop, we estimate cumulative climate changing emissions would be reduced by 77 million metric tons of CO_2eq for the time period 2026 through 2035 and 144 million metric tons for 2026 through 2045 (Figure 4).[9] This alternative would also result in ZEVs being 59% of vehicles on the road in 2035, compared to less than half (48%) under CARB's proposed ACCII rule.

[9] Emissions reductions based on EMFAC 2021 VMT, sales rates, implied retirement rate, and ICE emissions rates. The CAISO Integrated Resource Planning results were used to estimate plug-in vehicle emissions. ZEVs are modeled as BEVs.

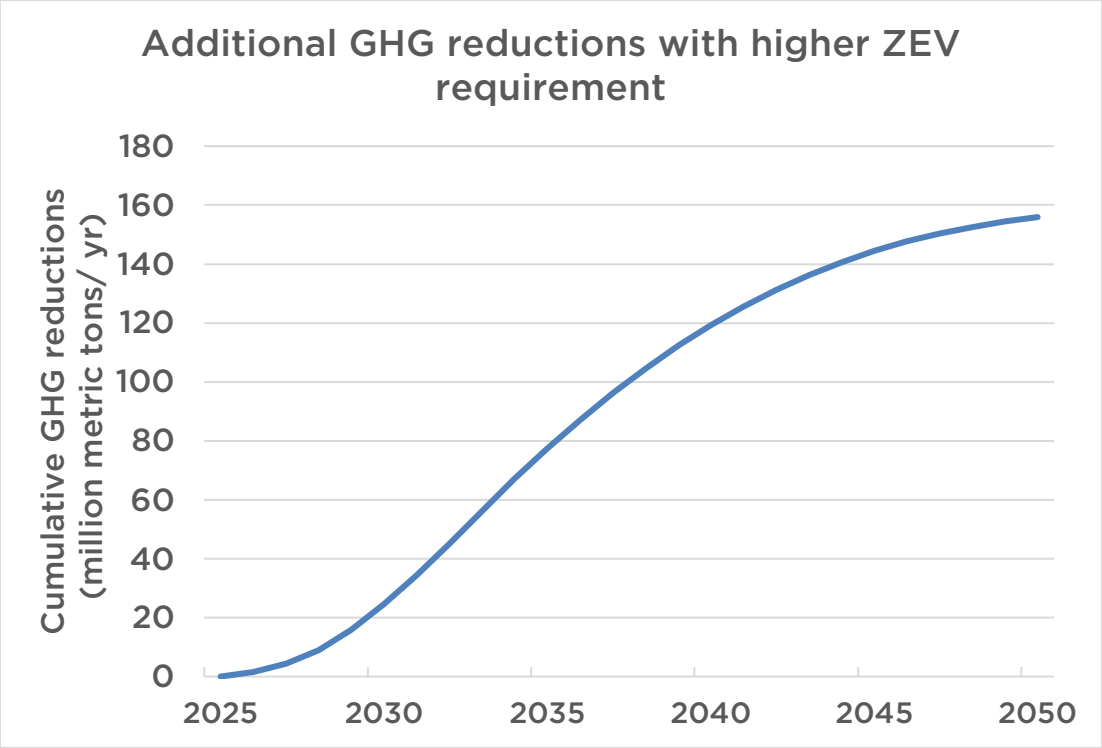

Figure 4: Adopting a ZEV requirement consistent with the "ASAP" scenario from the May 6th workshop would result in significant additional GHG reductions compared to the proposed ACCII ZEV requirement.

CARB needs to show leadership and protect the well-being of Californians

UCS urges CARB to use its full authority under the Clean Air Act to set ACCII regulations that ensure a rapid transition to zero-emissions vehicles. Climate change and air pollution continue to threaten the health and well-being of all Californians. A rapid transition to zero-emissions vehicles is a critical solution to address the largest source of climate pollution in our state. CARB has long played an important leadership role reducing vehicle pollution and carbon emissions, but a weaker ACCII rule threatens this leadership. We look forward to working with staff and further discussions on this issue of vital importance.

Sincerely,

David Reichmuth, Ph.D.
Senior Engineer
Union of Concerned Scientists